EXPLORING PSYCHOSOCIAL RISK FACTORS FOR STROKE IN YOUNG WOMEN EXPOSED TO DOMESTIC VIOLENCE

YVONNE SMITH

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ABSTRACT

Background and purpose: The incidence of stroke is projected to increase worldwide and reduction of risk of the first stroke is therefore important. First stroke in young women often poses a diagnostic challenge but it has been suggested the risk is associated with hightened exposure to domestic abuse. This UK study was conducted to determine the incidence and examine the predisposing risk factors for early stroke in young women suffering domestic violence. The effect of a range of psychosocial variables and health behaviours on the incidence of strokes in young women in an abusive relationship is assessed.

Methods: A cross-sectional survey collected information by self-report questionnaires on 237 women aged 18-56 exposed to domestic violence. The survey instrument measured the negative consequences of abuse and comprised demographic information, health status assessment, physical health illnesses and history of abuse. The GHQ-12 a stress measure was employed to gauge the effects of exposure to threatening life events. Correlational analyses and factor analysis were performed. Data was matched for women aged 20-44 with the average annual incidence rates of risk of first stroke in young women according to the Oxford Vascular stroke project register

Results and conclusions: Unsurprisingly, a high incidence of depression was found in this study even when the majority of women were on medication. A number of high-risk behaviours were also associated with strangulation, alongside the physical trauma. The incidence of first stroke found in the study was 5 cases classified as 3 ischemic and 2 hemorrhagic strokes, such a high frequency has not previously been described in the research literature. According to Oxford data the incidence of stroke among women aged 20-44 in the UK is 0.14/1000 per year. Stroke sub-type incidence rates were found to be 10 fold increased risk for ischemic and 15 fold increased risk for hemorrhagic stroke compared with the matched control. Trauma was found to be the most common predisposing factor to stroke other reported risk factors to increase the risk of stroke included poor health profile, migraine, and heavy alcohol consumption. These incidence rates may be underestimates as a consequence of women not attending for medical care, hence tragically managing stroke-related symptoms in the home. However, due to the small numbers of stroke victims the results must be viewed with caution.

Key words: stroke; young women; domestic violence; risk factors; psychosocial.

Science is built up with facts, as a house is with stones.
But a collection of facts is no more a science than a heap of stones is a house
La Science et l'Hypothese (Jules Henri Poincare 1908)

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PREFACE

This thesis exclusively focuses on women as victims of violence; it is fully acknowledged that both men and women experience incidents of domestic violence. The main purpose of this thesis is to investigate associations between the risk factors for stroke in young women who suffer domestic violence. Attention is focused on the underlying etiology of stroke and the exposure of domestic violence (DV) and its relative contribution compared with other established risk factors. We provide an overview of the extent to which psychosocial and environmental factors interconnect to the development of medical conditions and what mechanisms might be involved.

An overview of the different chapters follows. A brief background on the scope of domestic violence as a major stressful life event and social and biomedical consequences, in addition to other factors found to be associated with stroke risk are discussed in Chapter I. Chapter II is organized around 3 health topics. The first topic considers the health status of women exposed to domestic violence and briefly discusses stress, health and illness. The second topic discusses traumatic injury as a result of domestic violence and provides an understanding of the mechanisms of injury and subsequent risk factors for stroke. The final topic provides an overview of the epidemiology of stroke and refers to etiologic factors that may predispose the adult population to stroke. Chapter III discusses the role of stressors and stressful life events, and there association to illness. Biological and psychological strains are discussed relative to physiological alterations experienced by victims of

abuse. Chapter IV presents the method used for the analysis. Chapter V presents the data, Chapters VI and VII summarise the empirical findings and present the conclusions of the research. Recommendations for future research directions are presented. .

CHAPTER 1: INTRODUCTION

This chapter introduces research findings on domestic abuse and the long - term health outcomes associated with such abuse.

1.1 The Effects of Domestic Violence on Society

The magnitude of domestic violence is wide ranging for the victim, their children and wider society, and represents a serious public health concern, which has implications for the victims quality of life and long-term health. In the United Kingdom, many cases of intentional domestic violence result in death. Two women are killed every week and one in eight assaulted repeatedly by a partner or former partner (Nicholas, Povey, Walker & Kershaw, 2005). The associated morbidity exceeds that for war, cancer or motor vehicle accidents (Brewer, Roy & Smith, 2006; Nicholas, et al., 2005).

There is no universally accepted definition of the term domestic violence which is used synonymously with abuse. The UK Department of Health (DoH) adopted the Home Office definition as a continuum of behaviour, which cites; “any incident of threatening behaviour, violence, or abuse (psychological, physical, sexual, financial or emotional) between adults who are or have been intimate partners or family members, regardless of gender or sexuality” (Department of Health, 2000). There is no typical profile of domestic violence, which affects women regardless of age, socioeconomic status, education, ethnicity or sexual orientation. And often co-occurs in forms of physical and psychological abuse which can start at any point in a

relationship (Heise & Garcia-Moreno, 2002). The prevalence of domestic violence is widespread among different cultures worldwide and remains largely a hidden crime in black and minority ethnic families socially isolating the victims from support networks (Berkman & Glass, 2000). This cycle of psychological maltreatment involves issues of power and control which forces the victim to become dependent on the abusive partner for information, social and financial resources (Choudry, 1996).

Studies have shown that domestic violence in the UK is committed every six minutes with police attending an estimated 1300 calls each day, which equate to over 570,000 calls each year (Stanko, 2000, 2001). Dodd, Nicholas, Povey and Walker (2004) reporting on results from the British Crime Survey identified that only 40.2% of domestic violence incidents are actually reported to the police. Furthermore, a study by Jaffe, Wolfe and Wilson (1986) found that women experience thirty-five episodes of violence before seeking help. Over the last five years specialist domestic violence courts have made an impact on reduction of repeat victimisation (Sissons, 2002).

Dodd et al., (2004) identified that 45% of all female homicides are killed by present or former partners (Mullender & Morley, 1994). The British Crime Survey (2005) report identified that some women may be at higher risk of violence than others including women under twenty-five years, teen

relationships and pregnancy this trend reflects the overall trend reported by Mirlees-Black (1999).

1.2 Domestic Violence the Hidden Crime

Within the United Kingdom, the best indicators of domestic violence offences are currently measured and recorded by survey data of 'violence against the person' from Home Office and Government statistics. The differing definition of domestic violence makes it difficult to collate and compare data as the term domestic violence is used to describe a range of criminal offences occurring in different circumstances. No UK central database exists therefore we can only rely on snapshot reports from the Home Office which can lead to unconfirmed findings thus, significant gaps exist in our knowledge of this phenomenon (Mirlees-Black, 1999; Walby & Myhill, 2001a). A major issue for debate is that statistics collated by the Home Office for surveys do not identify domestic violence incidents as a separate category in view of the fact it is not a specific statutory offence. Nevertheless, in reality, domestic violence is a highly under-reported crime and most cases of domestic violence with two in three of worst incidents with serious injury are not reported due to a range of reasons e.g., including a victims emotional involvement and fear of reprisals (British Crime Survey, 2001; Stanko, 2000, 2001).

In terms of research this population is relatively inaccessible. There are challenging ethical dilemmas and data relies heavily upon self-report measurement. Gatekeepers safeguard and manage questionnaire

distribution and collation of data. This is a challenge to the measurement of the extent of domestic violence. The most common survey measurements used in studies tend to be cross-sectional studies which tend to have their problems in that they are based on assumptions that prevent the determination of causation. Longitudinal studies are a more effective measurement to establish causation and long-term effects, which makes them better predictors.

As in any kind of population based study, self report measures may fail to specify reliable and valid data, which may be biased in nature as a result of an individuals negative affectivity disposition, which generates further problems in extending research on a marginalised hard–to-reach population (Watson & Pennebaker,1989). Researchers are challenged in reaching a population, which hides the effects of abuse from society. For a variety of reasons this marginalised group are not captured in conventional surveillance data thus, unbiased estimates are produced (Mezey, Bacchus, Bewley & White, 2005).

1.3 Domestic Violence a Multi-factorial Problem

Studies conducted on risks for women leaving an abusive relationship indicate that women leaving without preparation and social support may increase the risk of violence or may even be confronted with returning to the abusive relationship (Griffing, Ragin, Sage, Madry, Bingham & Primm, 2002; Tan, Basta, Sullivan & Davidson, 1995). Research findings indicate that lack of shelter or inappropriate

shelter, income, custody and children issues were some of the main reasons for returning (Martin, Berenson, Griffing, Ragin, Sage, Madry, Bingham & Primm, 2000). Other important factors indicate abused women visit their General Practitioner (GP) and Accident and Emergency (A&E) department more frequently than normal but are often not screened for domestic violence (Davidson, Garcia, Grisso, King & Marchant, 2000, 2001). It has been suggested that front line health care providers should routinely enquire as they play a central role during patient contact in early recognition and intervention (Stark & Flitcraft, 1996). These longstanding issues led to the production of the Department of Health Domestic Abuse resource manual developed in 2000, comprising important initiatives of best practice screening all women in health care settings. The manual suggests that front-line health professionals should consider 'routine enquiry.' However, this haphazard screening initiative has been emphasized a failure as arguably, for an intervention to have effect, would involve institutionalising throughout the health service (Department of health, 2000).

1.4 Stress and Outcomes of Stress

Psychological stress can induce a range of physical illness associated with the development and progression of major disease risk (Brown & Harris, 1978, 1989; Engel, 1971). Stressful life circumstances can include a range of positive and negative cumulative daily hassles and chronic stressors. Stressors may include the psychological effects of the aftermath of a world disaster, divorce, death of a loved one. Or less dramatically the birth of a

child, marriage, bullying or long term exposure to frustrating circumstances can induce stress. All of these perceived stress events generate different individual responses within a specific context. This indicates the influence of an individual's cognitive style, sensitivity and susceptibility to stress. This is important to the way a stressor is appraised (i.e. establishing control) and the coping strategies used to mediate the stressful demand (Kanner, Coyne, Schaever & Lazarus, 1981; Taylor, Repetti & Seeman, 1997).

Some researchers interested in the role of stressful life events and illness argue that exposure to negative events may not always generate stress (Adler & Matthews, 1994; Eby, 2004; Watson & Pennebaker,1989). They have proposed individual characteristics which relate to social support and the buffering theory, personality factors, and differences in stress reactivity, lifestyles, coping styles and strategies adopted in environments. However, the relationships are not simple (Berkman & Syme, 1979; Cassel, 1976; Hagemann, 1992; Lazarus & Folkman, 1984). The process of victimisation includes a process which primarily involves identification as a victim and then a survivor (Casarez-Levison, 1992; Hagemann, 1992). This model of victimisation indicates that victims move through transition utilising active strategies at their disposal to create coping strategies to maximise their safety (Casarez–Levison, 1992; Parker & Endler, 1992, 1996). During this time the victim attempts to connect meaning to the victimisation (Baumeister, 1991; Park & Folkman, 1997). This is consistent with other research findings from (e.g., Amatea & Fong 1991; Koss, Woodruff & Koss, 1990; Norris,

Kaniasty & Thompson, 1997) on the impact of role stressors, personal resources and personality variables (Mitchell & Hodson, 1983).

The growing body of literature on the role of stress draws a link between the interplay of biology, psychology and social factors better known as the biopsychosocial perspective to explain how psychosocial factors can influence an individual's health or exacerbate illness (Brown & Harris, 1978, 1989; Holmes & Rahe, 1967). All these factors take account of physiological and psychological factors orchestrated by individual differences in coping responses to demands from the environment, emotional significance of experiences, available social support, internal physiological responses (i.e., cerebrovascular and immune functioning alterations), self-belief, cognitive and personality styles, and different lifestyles (Cohen & Wills, 1985; Eysenck, 1985; Lazarus & Folkman, 1984). The complex interactions between these factors make it difficult for researchers to establish any conclusive clinical evidence for the relationship between stressful life circumstances and measurement of an individual's threshold for disease risk (Cohen & Herbert, 1996).

The imbalances of power relations in a domestic violence relationship create a stressful unhealthy environment in which women are restricted in their ability to exert power and control and where conflict resolution is ineffectual. In the absence of social support many victims of abuse may appear controlling though, have learned to be helpless as a result of being unable to

exercise control over their own lives feeing powerless to stop the violence. The experience of life event demands characterised by protracted emotional arousal, helplessness and lack of control experienced in domestic violence exposes women to long-term distressing life events and ill health (Craig & Brown, 1984; Creed, 1985; Grant, Brown, Harris, McDonald, Patterson & Trimble, 1989; Henry, 1986).

Certain studies have suggested that the contribution of excess marked life stress is one of the determinants of stroke onset (House, Dennis, Mogridge, Hawton & Warlow, 1990; Murphy & Brown, 1980.). This claim was consistent with the author's previous study finding of first-ever in a lifetime stroke in young women exposed to threat and life changing events (Smith, 2005). According to growing research women exposed to violence have a greater propensity to a range of episodes of physical illnesses many connected to stress and stroke related symptoms (i.e., asthma, diabetes, hypertension, migraine, gastrointestinal symptoms, musculoskeletal problems, depression and anxiety) and impaired physiological functioning to ward off disease as a result of altered immune imbalances (Carasso,Yehuda, Ben-Uriah, 1981; Craig & Brown, 1984; Storey, 1985; Tuomilehto, Bonita, Stewart , Nissinen & Salonen, 1991).

Several authors work on domestic violence, problem lifestyle factors and the ill effects of stressors implicate an initiation of negative health behaviours as coping strategies to combat the exposure to demanding life experiences

(Emerson & Harrison, 1990). Researchers have demonstrated that negative emotional coping responses of victimisation can elicit a range of interpersonal stress and maladaptive coping i.e., changes in health practices; sexual recklessness, smoking, alcohol and substance abuse, eating disturbances and alterations in interpersonal behaviour such as depression, self-harming and thoughts of suicide all of which have the potential to develop and accelerate the risk of hypertension (high blood pressure) (Billings & Moos, 1981; Cooper, Frone, Russell & Mudar, 1995; Emerson & Harrison, 1990; Roth & Cohen, 1986; Stark & Flitcraft, 1996; Tuomilehto, et.,1991; Windle & Windle,1996) and others.

Russell and Shirk's (1993) survey of 535 abused women on women's anger and eating disorder found that victims with greater life event exposure are more likely to experience negative emotions, related to feelings of guilt, sense of rejection and resentment which are implicated in various forms of self-destructive behaviours such as eating disturbances. The study notes some association of anger expression and disease risk as a consequence of the unremitting nature of the violence and abuse. The range of problem life style behaviour endangers women further as women using drugs and alcohol are more prone to additional sources of stress and risk (eg., strangulation and homicide) as evidenced by Sharps, Campbell, Campbell, Gary and Webster (2003). Recognised risk factors for stroke include many of the negative behaviours adopted by women exposed to violence and highlight the importance of considering risk and psychosocial aspects of abuse and

other risk factors for stroke (You, McNeil, O'Malley, Davis, Thrift, & Donnan, 1997).

1.5 Factors Associated with Stroke Risk

Over the past few decades there has been an increasing awareness and interest in the health-damaging effects of domestic violence. Medical case study reports in the United States (e.g., Malek, Higashida, Phatouros, Halback, 1999; Malek, Higashida, Halback, Dowd, Phatouros, Lempert, Meyers, Smith & Stoney 2000; Milligan & Anderson, 1980) loosely associated cases of stroke in young women with domestic violence but, the evidence was based upon small samples and remains inconclusive. Whilst advancing age is the major risk factor for stroke; studies on correlating high risk factors for stroke in young women are less well documented particularly, stroke of undetermined origin. The most common reported cause of stroke in young adults under forty-five years of age is carotid artery dissection often found in patients that have suffered traumatic injury to the head or strangulation (Marshall, 1982). As can be seen here there is various support for links between environmental factors and stroke however, the etiology remains elusive.

Conclusion

This chapter has provided an introduction to a controversial phenomenon and attempted to provide an overview of our current understanding of domestic violence. The issues of the thesis are not straightforward; literature

on this topic presents an often-contradictory body of evidence. A major issue for debate surrounds specific methodological problems related to measurement data; domestic violence research is largely dependent on self-report measures. The very nature of this hidden crime identifies serious adverse consequences for its victims, there are no easy solutions reported. Domestic violence epidemiology proposed biological mechanisms and several causal pathways that may be of importance for the relation between exposure to domestic violence and stroke however, fails to address the implications of risk and psychosocial factors effectively.

CHAPTER II: BACKGROUND

2.1 Introduction

Chapter II discusses the theoretical perspective that may have informed some of the adverse health outcomes resulting from exposure to domestic violence. The chapter is organized around 3 major topics. The first topic considers the health status of women exposed to domestic violence and discusses briefly stress, health and illness and the possible causal pathways to disease that include environmental demands, biological and psychological processes and how these maybe linked to physiological alterations experienced by victims of abuse. The second topic discusses traumatic injury as a result of domestic violence and provides an understanding of the mechanisms of injury and subsequent risk factors for stroke. The final topic provides an overview of the epidemiology of stroke and discusses undetermined causes of stroke. The overall literature explores the impact of risk factors for stroke in young women. The chapter aims to delineate the potential high-risk factors of exposure to domestic violence. The well-known risk and modifiable life-style factors for stroke are discussed together with other proposed causal pathways to stroke disease.

2.2 The Health Status of Women Exposed to Violence

There have been several research efforts to investigate the exposure to domestic violence and its subsequent implications for quality of life and long-term health (Campbell, 2002). There is a small body of literature focusing on

health consequences of women exposed to violence documenting the difficulties in assessing the direct impact of abuse. For example, some of the literature suggests that abused women are more prone to greater rates of mortality tentatively linking the role of stressors as precursors to illness (Campbell, 2002; Ratner, 1993, 1998). The difficulty women have in coping with imposed demanding life circumstances in abusive relationships are documented by researchers that address the psychological and behavioural strains. For example, they have identified that abused women suffer severe consequences of negative affectivity that include; stress and distress, psychological traits, poorer psychosocial and general health profiles and greater utilisation of primary and mental health resources which continue long after women escape relationships (Cohen, Tyrrell & Smith 1993; Plichta, 1992, 2001, 2004; Sutherland, Bybee & Sullivan, 2002; Watson & Pennebaker, 1989).

Research has demonstrated that that one in nine women will seek medical care as result of assault and have increased contact with health professionals as a consequence of the exacerbated levels of stress and severity of psychological and physical injuries (Pahl, 1995). This is echoed in other study findings that provide evidence that domestic violence is five times more prevalent than medical case notes indicate and the distress of victimisation results in reduced ability to function psychologically, socially or interpersonally (Mezey & Bewley, 2002; Watson & Pennebaker, 1989). Further, Pahl (1995) suggests that survivors of violence are more likely to be

in contact with health professionals than any other service as a result of psychosocial stress and poorer coping resources. Where studies exist, on health status of women much of the research is flawed by researchers' inadequate attempt to address a wider range of variables involving physiological and psychological predispositions. Furthermore, a majority of studies fail to demonstrate an overall clinically significant relationship. In the absence of good measurement tools researchers have to rely heavily on self-report measures, which may fail to capture the relationship between stress, health and illness.

Some researchers have examined the relationship of self-perceived health status and demonstrate that largely, victims record poorer self-ratings of health status (Ratner, 1993, 1998). Conversely, in a study sample of 397 abused women asked if domestic violence had affected their lives. Study findings suggested that women who related to their health status as 'good' were found to have repeat contact with primary care resources reporting at least twenty one health symptoms. Many of the chronic diseases were documented to have distressing symptoms including extenuating somatic conditions; pain, migraine, gastrointestinal abdominal pain, viral health problems, eating problems, dizziness, sleep problems, depressive conditions and musculoskeletal difficulties (Coker, Smith, Bethea, King & McKeown, 2000; Craig & Brown, 1984; Creed, 1985; Henry, 1986; Higgins & Endler,1995; Sutherland et al., 2002).

Domestic violence, including, living in implicit threat and fear is likely to create a significant source of stress (Miller, Brody & Summerton, 1988). Clearly the literature on health and domestic violence documents associations with stressful life events and provides substantial evidence of correlations between psychological stress and greater susceptibility by this population in developing a range of chronic diseases (Brown & Harris, 1978, 1989; Holmes & Masuda, 1974).

The importance of how social support networks influence physical outcomes and provide a buffering effect to mediate life stress is well documented (Berkman & Glass, 2000; Cassel, 1976). Abused women who are exposed to stressful life events are found to have inadequate social support networks and be at greater risk of developing depression (Brown & Harris, 1978, 1989; Campbell, Sullivan & Davidson, 1995). In the majority of cases the only source of perceived social support is likely to be emotional support exchanged in brief consultations with primary health care practitioners (Auerbach & Kilmann, 1977; Mitchell & Hodson, 1983). On the other hand, according to research from a series of interviews with general health practitioners domestic violence is rarely identified within a surgery setting it is therefore questionable as to the extent of emotional support women actually receive (Clifton, Jacobs & Mullock, 1996). A study by Richardson and Feder (1997) suggest that despite routine contact and best placed positions to screen for domestic violence, health professionals often fail to recognise the needs, ask appropriate questions or respond appropriately to this social

phenomenon (Davidson et al., 2000; Waalen, Goodwin, Spitz, Peterson & Saltzman, 2000).

2.2.1 Negative Health Behaviours

The negative consequences of the stress of domestic violence are reported in the literature to lead to a variety of negative effects which have an impact upon psychological health including; causal attributions, and negative emotions such as fear and anxiety (Mitchell & Hodson, 1983; Wills, 1990). Modcrin-McCarthy and Tollett (1993) have suggested that domestically abused women are prone to disengage emotionally. They are also more fatalistic about their health and in their ability to productively manage anger, it is suggested that this is reflected in poorer health as a result of poor control over the situation. Lerner (1985) further suggests that women from domestic violence relationships develop negative self-images, low self-esteem and suppress anger as a consequence of fear of reprisal (Campbell, 1995; Crawford, Kippax, Onyx, Gault & Benton, 1992).

Some researchers have indicated that the experience of chronic stress, traumatic injury and emotional and psychological abuse, has implications for coping strategies of women with a history of domestic violence (Tjaden & Thoennes, 2000). The mounting evidence suggests that stressors (affective disturbances) may be linked to negative health-related behaviours (Cohen, Tyrell & Smith, 1991b). The development of a sedentary lifestyle and health threatening-behaviours are indicative of a motive/strategy to cope with

stressors (Windle & Windle, 1996). The role of self-belief, cognitive processes and coping strategies are largely reflected in poor health practice in women exposed to violence as evidenced by (Campbell, 1995; Crawford, et al., 1992 Lerner, 1985). These often desperate strategies are perhaps an attempt by the victims to resist external stress, disguise adverse emotions and gain power and control yet, place women at greater risk of harm from sexual attack and severe injuries whilst under the influence of drugs or alcohol. Victims of abuse often engage in unhealthy lifestyles and risk taking behaviours including: illicit drug use, heavy alcohol consumption, engaging in high-risk sexual behaviour, smoking, physical inactivity, unhealthy diet-related behaviour, overeating and suicide attempts are all attempts to alleviate chronic levels of stress on the other hand place women at increased risk for disease as evidenced in studies by (Haapaniemi, Hillbom & Juvela, 1997; Hillbom, Haapaneiemi, Juvela, Palomaki, Numminen, & Kasta, 1995; Windle & Windle,1996).

Research suggests that negative emotionality is related to greater risk of hypertension, coronary heart disease and stroke (Coker et al., 2000; Tuomilehto, et al.,1991; Wills, 1990). A survey of women seeking primary health care have shown that those subjected to domestic violence in the last year were three times more likely to be drinking heavily and four times more likely to be using drugs. However, the study fails to provide evidence whether the women were involved in problem drinking and drug use before or during the relationship (Sharps, Campbell, Campbell, Gary & Webster, 2003).

Alcohol abuse can have serious implications for health and is an established associated risk factor for stroke as evidenced by Haapaniemi et al., (1997). In addition abused women are reported to experience cognitive problems by impaired neuropsychological functioning with progression of severe memory problems, lack of judgement, cognitive disruption, drowsiness and disorientation (Sarason, Sarason, Keefe, Hayes & Shearin, 1986).

Despite the well-documented harmful effects of tobacco use, there is a growing body of evidence correlating the relationship between stressors, domestic violence and smoking (Hillbom et al., 1995). Weinbaum, Stratton, Chavez, Motylewski-Link, Barrera and Courtney (2001) points to an overlap between demographic risk factors for domestic violence and smoking suggesting that victims with a history of domestic violence are more likely to display negative health behaviours and be at greater risk of smoking (Wolf, D'Agostino & Kannel, 1988; Wolf, D'Agostino, Kannel & Belanger, 1991).

A study by Plichta (2004) into the association between domestic violence and health consequences supports Weinbaum et al., (2001) findings reiterating the concern about the interaction of domestic violence and smoking for women's health. Most research studies have focused on the links between physical violence and smoking. The links between psychological abuse, sexual abuse and smoking have largely been neglected. Apart from the work of Roberts, Auinger and Klein (2005) whose study with sexually active adolescent females identified a higher incidence of smoking and illegal drug

use during domestic violence and went some way to evidencing a link between severity of abuse and smoking. The way in which nicotine works is complex in that it produces an alertness and arousal followed by calming and reduction of tension after smoking. Researchers suggest that smoking may act as a buffer and stress reliever (Ackerson, Kawachi, Barbeau & Subramanian, 2007). They suggest that smoking may be used to cope with affective under arousal (depression) and affective states of over arousal (anxiety and post- traumatic stress disorder - PTSD). Acierno, Kilpatrick and Resnick (1997) study of violent assault, PTSD and depression showed a higher risk of smoking for those with depressive illness and PTSD for women suffering from long term abuse. The study did however, identify that there was no increase in smoking associated with recent assault, current PTSD and current depression. These findings were corroborated by a study on smoking, stress and negative affect (Kessel, Stroud & Paronis, 2003). Overall given the contradictory findings in the literature in assessing stress health and illness in domestic violence it would be fair to say that the relationships are complex.

2.3 Traumatic Injury Risk Factors

Domestic violence is reported to be the single most common reason for trauma in women who live in chronic fear of assault (Attala, 1996; Brewer et al., 2006; Campbell, 2002). A large body of evidence have documented the negative affects of trauma and severe injuries resultant of assault requiring medical treatment. Studies have documented typical presentations linked to strangulation, abusive head injury and intentional violent shaking (Monahan

& O'Leary, 1999; Sheridan & Nash, 2007). Researchers have suggested that these injuries can present diagnostic challenges as they can present a spectrum of symptoms ranging from severe headache, neck pain, fatigue and clinical syndrome consistent with stroke (Cascardi, Langhinrichsen & Vivian, 1992; National Brain Association, 2003).

Carrigan (2000) describe an unusual medical case study of a 34-year-old woman that presented with medical complications associated to 'shaken baby syndrome' resulting from a domestic violence traumatic injury. Characterized by localized damage of retinal hemorrhages, subdural hematoma, blurred vision and patterned bruising. These authors note that in a syndrome of battering, victims may have repeat contact for medical treatment of recurrent injuries. They enter entering emergency departments with deceivingly vague signs and symptoms. Despite the high fatality risk of strangulation and the classic signs of brain injury present, young women have been misunderstood and dismissed in hospital emergency departments (Sheridan & Nash, 2007). In a majority of cases they have been misdiagnosed with neck strain, migraines, or labelled as suffering hypochondria, some even treated for migraine and drug overdoses, or stress related problems (McWilliams & McKiernan, 1993). These cases highlight the challenges for attending medical staff in medical evaluation in detecting victims exposed to violence and differentiating those women at high risk for injury. As seen here domestic violence represents major neurological risk

particularly in women who have experienced a strangulation episode or head injury.

Research on domestic violence and health has increased dramatically over the last twenty years, mainly conducted in the United States (Campbell et al., 2007; Smith, Mills & Taliaferro, 2001; Taliaferro, Mills & Walker, 2001; Wilbur, Higley, Hatfield, Surprenant, Taliaferro, Smith & Paolo, 2001). A considerable volume of the underpinning literature across the entire spectrum of domestic violence is dated and constantly reiterated within studies, much of this previous research has formalised the existing knowledge of abuse in general. However, it has provided little guidance to inform practice and generated conflict over issues relating to screening (Ramsay, Richardson, Carter, Davidson & Feder, 2002; Waalen et al., 2000; Wathen & MacMillan, 2003). Taliaferro et al., (2001) research study specify that for most abused women, the episodes of injury are not usually single isolated cases and reported to be escalating both in frequency and severity.

Manual strangulation has been noted, consistently in research, to be an indicator of escalating violence and a lethal method used in domestic assault which is often misidentified and more common than previously thought (Glass, Laughon, Campbell, Block, Hanson, Sharps & Taliaferro, 2008; Sheridan & Nash, 2007; Smith et al., 2001; Taliaferro et al., 2001; Wilbur et al., 2001). Victims reporting on experiences of strangulation report intense headache and neck pain symptoms consistent with those of an arterial wall

tear. Research explaining the difficulties in detection and diagnosis of neck compression injuries suggest that from observations patients may rarely have any visible external injuries or physical signs present and indicate that symptoms may evolve over hours or days (Began, Sharma, & Bradley, 1990).

The hallmark of disturbances found in carotid artery dissection presents a range of clinical features including; neurological impairment, severe headache, neck pain, visual loss, horner syndrome, vomiting, swelling to the neck, raspy voice, swallowing and breathing problems and changed mental health status resulting from the trauma (Strack, McClane & Hawley, 1999, 2000, 2001). Clinical research studies have highlighted health complications for victims of strangulation injury associated to the development of neurologic onset (Hilton-Jones & Warlow, 1985; Koton, Tanne, Bornstein & Green, 2004; Malek et al., 1999, 2000; Milligan & Anderson, 1980; Smith et al., 2001; Smith, 2005). In one study, Jackson, Philp, Nutter and Diller (2002) found that assessments for signs and symptoms of neurological dysfunction in victims of domestic violence are rarely conducted, women are rarely asked about the origin of their injuries in health care settings and these findings are consistent with previous literature (Rand, 1997).

The work of Strack, McClane and Hawley (2001) has been particularly influential in understanding the intensity of stress and changed mental status as a result of strangulation trauma in the context of domestic violence. Their

papers address manual strangulation as an indicator of high risk violence and homicide. Moving on to more specific examination of the risks suggest that the severity of the injury may vary by type of strangulation and if the victim attempted to break free, the duration, force and location of the injury. Hawley (1999) from a physicians perspective on the findings from post-mortem reports and medical case studies suggest that victims who attempt to break free in the strangulation episode often result in visible injuries of scratches, faint pressure marks behind the ears, lacerations and bruising around the throat caused by the victim in their attempt to remove the perpetrators hands from around the neck (Strack, McClane & Hawley, 2001). Further Hawley expresses medical concerns related to best outcome specifically, that timely intervention is paramount in cases of strangulation injury.

Strack and McClane (2002) cite the popular definition and facts about strangulation. The terms used for choking and strangulation are often used interchangeably by the lay person but as a consequence previously have led to both under and over reporting of incidence particularly in self-report questionnaires (Mirlees-Black, 1999). However, there is a true distinction, the technical terms are as follows; *Strangulation* is defined as “a form of asphyxia characterized by closure of the blood vessels and air passages of the neck as a result of external pressures on the neck”. The term *choking* “is to keep someone from breathing in a normal way by compressing or obstructing the windpipe, adulterating available air or to block entirely the windpipe (e.g. hard sweet or food”). Strack explains that it only takes; “11 pounds of pressure

placed on both carotid arteries for 10 seconds to cause unconsciousness" (Strack & McClane, 1999, p. 91) Strangulation itself can be categorized as manual strangulation, committed by the use of one or two hands placed tightly around the neck and throat, preventing the flow of blood too and from the brain. Similarly, strangulation by ligature refers to use of a cord, rope or item of clothing placed around the neck that restricts blood flow by closing the windpipe (Strack & McClane, 1999, p. 91).

McClane and Hawley (2001) suggest that in trauma to the neck the delayed presentation and absence of neurological signs is not uncommon, in intimal tears to carotid vessels in the neck, despite their clinical manifestations. They further suggest that strangulation injury can result in plaque formation as a result of the compression to the neck however, are under-recognised as they heal relatively quickly nevertheless, a significant risk factor which can precipitate a stroke (Matsuura, Rosenthal, Jerius, Clark & Owens, 1997). Despite the plethora of research worldwide the impact of physical violence has only been loosely associated with the reporting of stroke in young women in medical case reports, moreover, none of these researchers have expanded upon their initial findings (Funk & Schuppel, 2003; Malek et al., 2000; Milligan & Anderson, 1980; Purvin, 1997). The relationship between domestic violence and stroke is enigmatic despite several reports tentatively linking strangulation and carotid artery damage to immediate and delayed incidence of stroke precipitated by direct neck trauma associated with domestic assault. Therefore, despite increased reporting of stroke in young

women exposed to domestic violence there remains a considerable gap in the scientific literature addressing high risk-injury and the impact of domestic violence on women's health (Malek et al., 1999; Milligan & Anderson; 1980; Smith et al., 2001). Stroke occurrences in younger women are relatively rare. Nonetheless, they constitute a major group of strokes that present diagnostic challenge in determining the exact cause (Abraham, Shetty & Jose,1971; Began et al.,1990; Bo, Malm & Carlberg, 1997; Erhardt, 2003; Gandolfo & Conti, 1993; Verona, Guerra & Bermejo, 2004).

Information from medical case reports and etiologic investigations on stroke in younger patient's in cases of vertebral and carotid artery dissections (tear) suggest that increased risk of stroke is in principal associated with direct traumatic injuries to the head and neck (Marshall, 1982; Norris, Beletsky & Nadareishvili, 2000). Nevertheless, the exact cause remains speculative with no strong supporting evidence within the literature (Anscombe, 1996; Bogousslavsky & Pierre, 1992; Bogousslavsky & Regli, 1987; Hart & Miller, 1983; Hart & Easton,1983; Siqueira-Neto, Santos & Fabio, 1996; Strack & McClane, 1999; Wilbur et at., 2001). Bogousslavsky et al., (1987) study suggests that internal carotid artery dissection is reported to be the cause in 5% to 20% of strokes in those younger than fifty years of age but concludes no clear causal relationships have been established (Marshall, 1982).

The life threatening consequences of living in a domestic abuse relationship are further addressed in research by Hilton-Jones and Warlow (1985)

examining the risk of neurological trauma as a result of neck and strangulation injuries. Their study identified that injury to the carotid artery was associated with an increased risk of immediate stroke in some patients. However, in other patients the presentation of stroke onset can be delayed. They assert that trauma involving sudden violent movement of the neck, violent shaking or direct neck injury by a blow or strangulation are likely mechanisms of carotid artery damage. It is accepted that carotid artery dissections can afflict all age groups, some of which may be the result of trivial accidents and others the consequence of sports accidents involving judo, motor vehicle accidents or directly in an assault (Auer, Kreek & Butt, 1994; Cantu, 1996; Harmsen, Rosengre, Tsipogami & Wilhelmsen, 1990; Viktrup, Knudsen & Hansen, 1995).

More recent research by Koton et al., (2004) in a Reuters Health Report (2004) identified factors triggering stroke. This research identified in the patients examined, seven significant triggers of common corollaries associated with domestic violence that occurred two hours preceding stroke onset. The characteristics included sudden neck movement, strong negative emotional states and the experience of severe stress trauma which they suggested increased the relative risk of stroke by fourteen fold (Koton et al., 2004). Research findings from a domestic violence study (Smith, 2005) on life stress events and long term health conducted in the UK identified stroke in 5.5% (n=7) women of reproductive age, a much higher incidence rate than is generally found in the population of this age. These findings were thirty-fold

higher than the national reported stroke incidence rates for women within the same age range between 18-56 years (Rothwell, Coull, Giles, Howard, Silver, Bull, Gutnikov, Edwards, Mant, Sackley, Farmer, Sandercock, Dennis, Warlow, Bamford & Anslow, 2004).

2.4 Epidemiology of Stroke

Stroke is the third leading cause of death and long-term disability in England and Wales accounting for 67,000 deaths annually. Within the UK, stroke audit figures show that 150,000 people each year will suffer a stroke with societal costs of around £8 billion a year. The total cost of stroke care and incidence of stroke have been predicted to rise worldwide because of population ageing and people engaging in unhealthier life styles. These concerns have acknowledged within the new government national stroke strategy to raise public awareness and prevention of stroke (DoH-National Stroke Strategy, 2007).

Research suggests that one person every three minutes suffers a stroke or transient ischemic attack (TIA). The introduction of recent government white papers; Health of the Nation, and Saving Lives: our Healthier Nation recognise stroke as a significant health care problem. The National Service Framework (NSF) comprises policy initiatives to reduce stroke mortality setting out clear targets of the NHS national stroke strategy in awareness and prevention of strokes. However, fail to adequately address issues of risk factors associated to stroke (Department of health, 2006).

The highest rates of stroke are found in Eastern Europe countries such as Bulgaria, Hungary and Romania (World Health Organisation, 1996). Mortality has decreased in many western countries; largely due to preventive measures focusing on life style changes and better medical care (Wolf et al., 1991). The decline in incidence may be associated with modifiable factors in reduction of risk in hypertension and smoking such as smoking cessation (Murray & Lopez, 1996). Well known recognised risk factors for strokes have been well studied and include family history of stroke, race (black), age, smoking, diet, excessive alcohol consumption, contraception pill and physical inactivity (Haapaniemi, et al., 1997; Hillbom et al.,1995).

Other increasing risk factors for stroke are associated with medical conditions such as hypertension, diabetes, previous strokes, carotid artery stenosis, ischemic heart disease, artrial fibrillation, educational attainment and lower socioeconomic classes (Hart, Hole, & Smith, 2000; Wolf et al.,1991). Various other risk factors have been found associated to first-ever stroke in the young including trauma and emotionally threatening life events preceding a stroke (Hilton-Jones & Warlow, 1985; House, Dennis, Mogridge, Hawton & Warlow, 1990; Murphy & Brown, 1980). Research suggests that one in four adults have hypertension and that stroke incidence could be substantially reduced if treated. Arguably, this is challenging as many people are often unaware they have hypertension due to lack of symptoms (Julian, 1983). The general misconception by lay public is that both stroke and heart disease are the same condition and that stroke is predominantly more prevalent in older

males due to difference in age distribution compared to those of females however, the reality is that stroke is a health issue for men and women alike (Pancioli, Broderick, Kothari, Brott, Tuchfarber, Miller, Khoury & Jauch, 1998).

In defining a stroke in simple terms, a stroke is a brain injury preceding an interruption of blood supply to the brain that results in neurological symptoms. The effects of the body can include long-term disability, which can include loss of speech, movement (paralysis) or death. There are two major pathological types of stroke; the most common form of stroke is *cerebral infarction* usually due to thrombosis or embolism. The other form of stroke known as *hemorrhagic* stroke is commonly referred to as 'a bleed' caused by burst blood vessels usually as a result of a burst aneurysm (swelling or weakening of the arterial or venous wall) resulting in the brain cells being deprived of oxygen.

The general public appears to have little understanding of the pathophysiology of stroke or of the warning signs and symptoms, risk factors and need for medical emergency response (Pancioli et al., 1998). The myth exists, that stroke is experienced only in older age groups, but people of all ages can suffer a stroke (Marshall, 1982). Although etiologic investigations have identified a number of possible causes a large percentage of cases are unable to determine the underlying cause (Began et al., 1990; Neto et al., 1996). Traditional risk factors have been claimed to explain only half of the

determined causes of stroke (Adams, Butler, Biller & Toffol, 1986; Began et al., 1990; Bogousslavsky & Pierre, 1992; Grindal, Cohen, Saul & Taylor, 1978; Hilton-Jones, & Warlow, 1985; Neto et al., 1996). However, publications and case reports on this topic are limited (Goldstein, Gray & Hulette, 1995).

According to the research that exists, the most common cause of stroke in young adults under forty-five years of age is carotid artery dissection found in patients that have suffered traumatic injury to the neck. As evidenced previously, damage to the internal carotid artery is not always recognised clinically and the course of events after the injury can be delayed for days or weeks after trauma resulting in delayed onset of stroke. Patients should be treated as a high-risk group following strangulation injury as the fragile clot formed over an arterial tear can be easily dislodged and embolize to the brain simply, by head movement which can lead to stroke (Hilton-Jones & Warlow, 1985; Koton et al., 2004; Malek et al., 1999,2000; Milligan & Anderson, 1980; Smith, et al., 2001; Smith, 2005). Other medical challenges show that pathologic examination does not always easily recognise the site of dissection because healing occurs relatively quickly (Strack, McClane & Hawley, 2001). It seems tenable to suggest that the pathogenesis of dissection remains challenging and plausibly multi-factorial; however, growing evidence on abnormalities in dissection associated with neck torsion are particularly prominent in young adult women as a result of traumatic

injury (Guth & Pachter, 2000; Hart & Miller, 1983; Jackson, et al., 2002; Mas, 2007).

Additional difficulties arise in gathering accurate statistics of stroke in young adults and even when classic signs are present young women have been dismissed in hospital emergency departments, which are congruent with the findings in domestic violence literature. In large part, this is because stroke is often overlooked in younger women due to medics stereotypical assumptions that stroke only happens to older people (Croft, 2002). The absence of medical attention can have devastating results for patient outcome.

2.4.1 Understanding the Risk factors for Stroke

The established risk factors for stroke have been well studied; the research that exists related to common risk factors is detailed in the following studies, some which relate to young women and increased risk for stroke. Diabetes has been identified as a medical condition risk factor for stroke (You, et al., 1997). Tuomilehto, Rastenyte and Jousilahti (1996) study in Finland quantified this risk and found that the risk was far greater in women accounting for a 33% increased risk of death from stroke, the type of pathologic stroke was mainly ischemic. The risk was further increased if the person was hypertensive and further exacerbated by smoking (Tuomilehto, et al., 1991,1996). Alcohol and contraceptive pill use were not found to influence outcome in this study.

Numerous studies have indicated for over a century that migraine sufferers are reported to be most common in young women and at increased risk for ischemic stroke (Alvarez, Matias-Guiu, Sumalla, Molins, Insa, Molto, Martin, Codina & Martinez-Vasquez, 1989). Specifically that the risk is greater marked for migraine with vision problems (aura) and exacerbated by oral contraceptive use, smoking and high blood pressure (Henrich, Sandercock, Warlow & Jones, 1986; Rothrock, Walicke, Swenson, Lyden & Logan 1988; Spaccavento & Solomon, 1984). Following the work of Tzourio, Tehindrazanarivelo, Igesias, Alperovitch, Chedru and d'Anglejanchatillon (1995) study of young women it is now documented that migraine with aura is more serious than once thought. Chang, Donaghy and Poulter (1999) study into migrainous stroke in young women analyzed other risk variables including oral contraception (high oestrogen levels) hypertension and smoking. Only the smoking variable showed a significant correlation to migrainous stroke in the study. According to Touze & Rothwell, 2007 "women are at greater risk of stroke if they have a parental family history of stroke" and these findings are further supported by Kim, Friedlander, Longstreth, Edwards, Schwartz, & Siscovick, 2004 on the effects of family history as a risk factor for stroke in young women although studies on this effect are less-well documented.

Extended research by MacClellan, Giles, Cole, Wozinak, Stern, Mitchell and Kitner (2007) of stroke in young women identified a significant attributed risk for migrainous stroke in women who smoked and used oral contraception.

They noted an association of ischemic stroke of undetermined cause. Oral contraceptive pill use specifically those with high oestrogen levels have been identified by the World Health Organisation to increase the risk of stroke in young women aged between 20 and 44 years of age by 13% in the western world (WHO, 2005) but, are quick to identify that this may be as a result of other co-existent risk factors such as smoking and hypertensive disorders.

Conclusion

This chapter concludes besides the established risk factors for stroke, that other dominant risk factors of potential importance for stroke should be considered. The stroke risk factors can be classified into those that are modifiable such as tobacco use and those that are not for instance age and domestic violence which is not easily modifiable. Taking into account the growth and aging of the population medical professionals will be faced with increased numbers of stroke and need to play a key role in public health preventative measures. The growing body of evidence indicates an association of increased reporting of stroke in young women in domestic violence relationships as a result of increased strangulation assaults and these findings suggest that victims are at greater risk for major morbidity or mortality. Compared to other risk factors, the relationship between exposure to domestic violence and stroke has been studied less extensively and underscore the importance for further understanding of the effects of domestic violence on health in reduction of stroke. Thus, there are still gaps

in the knowledge that make the scientific knowledge uncertain, that need to be addressed.

CHAPTER III: THREATENING LIFE EVENT STRESS

3.1 Introduction

This chapter focuses on sources of stress and examines individual differences in strain reaction when exposed to stressful situations. It considers a number of strategies for coping with stress and introduces the relationships between personality traits and coping. Further the chapter addresses the roles of environmental demands, psychological and biological concepts and considers the physiology of stress and how the demands on the body functionality can exceed the body resources and place a person at risk of disease (Stone & Costa, 1990).

3.2 Cognitive Appraisal in the Stress Process

As can be evidenced in the literature review, stress induced by domestic violence is likely to be substantial and may have a harmful impact on psychological adjustment with significant long-term effect on quality of life (Campbell, 2002; Heise et al., 1999). The imbalance of power relations in domestic violence relationships creates a stressful unhealthy environment in that women are restricted to exert power and control and conflict resolution is ineffectual. Although it is difficult to define stress (Selye, 1982), sufferers of domestic violence are likely to be confronted by prolonged exposure to life stress and constitute a high-risk population that can pose a serious health threat to the body functioning and major contributing factor to illness and disease (Lazarus, 1990; Selye,1976). As described briefly in previous

chapters of this thesis stress encompasses a range of negative influences and reaction processes created in circumstances of stressful traumatic experiences.

Researchers studying the effects of unwanted life event stress suggest chronic stress may influence a number of illnesses and diseases (Lazarus, 1990). The way in which the body responds to environmental demands (i.e., stressors of all types) is better understood traditionally in terms of the psychobiology of stress (Steptoe, 1991). This relates to the body's physiological reaction in response to threat and the cognitive processes in appraising the stressful event. This process describes the body's preparation to stressful challenges as it activates an allostasis response, which is the body's attempt to utilise resources to maintain stability in response to stressors on the normal levels of adaptive biological functioning (McEwen, 1998). The physical and psychological demands appraised by the individual endangering their bodily resources are the process whereby the individual adapts or adopts a strategy of coping behaviour in response to the stressor aimed at regulating distressing emotions (Selye, 1976).

The school of thought on the assessment of coping and transactional model of stress proposed by the work of Lazarus and Folkman (1984) define coping as "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus, 1990, p. 99). They

emphasise that the coping process may involve defensive strategies utilising problem-focused coping strategies in which an individual makes efforts to confront and change the stressor and actively take action to work to solve the problem. In contrast, emotion-focused coping is argued to be a non-productive strategy utilised when the source of stress is too demanding to reduce or resolve and a plausible case in point of domestic violence (Lazarus & Folkman, 1984). This coping strategy involves escape-avoidance and distancing to derive positive values from negative events geared to minimise the emotional distress.

Clearly specific problem solving and coping strategies will be required but essentially the locus of control adopted (internal, external or other) by an individual is fundamental in mediating the effects of a stressful life event. Arguably, this distinguishes an individual's difference in their vulnerability to illness and why not all people become ill (Adler & Matthews, 1994). Some researchers report that the mediating role of biological response of negative experience can be beneficial for survival and in preparation from the normal homeostatsis state for the 'fight/flight' body response to respond to the stressful situation. Clearly the interplay of neuro-endocrine changes as a result of activation of the sympathetic nervous system and increased secretion of hormones; norepinephrine, epinephrine and cortisol activity in response to threat also play an active role in an individuals approach to a stressful event. Conversely, over time if an individual is exposed to constant levels of imposed threat the physiological arousal state is required to work

overtime to resist the stressor. When the threat is terminated the shutting down of the hyperarousal state response involves a complex process which involves nervous and hormonal systems which have been stimulated involving increased secretion of stress hormones in the fight/flight response to stressors. However, if the body's resources are ineffective in returning systems to baseline levels of cortisol the over exposure to stress hormones can result in allostatic load.

It is tenable to suggest that women suffering domestic violence will be open to the elements of chronic stress and exposed to the exaggerated use of their body resources producing an imbalance with resources developing into exhausted state. Thus, at this point of burnout when the body's resources are depleted the immune system can be damaging to the individual by surpressing the immune system thus placing the individual at greater harm and susceptibility to chronic illness.

3.3 Psychosocial Environment and the Impact of Stressors

Some researchers have focused predominantly on stressors and indicated that some individuals may be more susceptible to illness than others and have also linked negative health behaviours of smoking and drinking alcohol as ways in which individuals combat stress (Pearlin & Schooler, 1978; Pearlin, 1982). Many studies have considered the relationship between life events, stress and coping strategies and immune functioning, suggesting that the, resultant stress of trauma in some victims may exacerbate chronic

illness in conditions such as heart disease and stroke (Billings & Moos, 1981; Brown & Harris, 1989; Folkman, 1984; Folkman & Lazarus,1984;.Heise, Ellsberg & Gottemoeller,1999).

In the cognitive and appraisal process of coping with internal and external demands of stressful experiences, a number of researchers argue that victims coping with enduring stress in immediate and long term situations of abuse may have the ability to develop a personal construct and search for personal meaning (Kelly, 1955). Further, they suggest that an individual's personal belief may generate a perception of control and sustain a positive psychological state, which may be continuously mediated by cognitive reappraisals during the process of coping with stress and trauma events (Janoff-Bulman & Frieze, 1983; Lazarus & Folkman, 1984; Park & Folkman, 1997). The relationships of finding positive meaning are consistent with other studies findings on coping with stressful events such as suffering and coping with loss (Baumeister, 1991; Park & Folkman, 1997). This may explain why women continue in situations where they are abused longer than they should.

Sutherland, Bybee and Sullivan (2002) have shown that as a consequence of enduring psychosocial stress, poorer coping resources and negative affect, domestic violence leads to increased likelihood use of mental health resources and increased attendance to general health practices. The common affects of stress related illness have been reported in studies and have noted that women are more prone to a range of psychosocial factors

including depression, stomach aches, sleep disturbance, migraine, elevated blood pressure, headaches, neck and backjoint pain and psychiatric illness presented in accident emergency departments following traumatic injuries (Emerson & Harrison, 1990; Guth & Pachter, 2000; Lazarus, 1990; Modcrin-McCarthy & Tollett, 1993).

Despite the large number of studies on domestic violence we still know little about how a victim can best cope with a stressful life event. What is more, how this may promote physical and mental health or exacerbate illness and whether factors such as age or distress prone personality differences have any influence (Stone & Costa, 1990). In the quest, for progress in domestic violence research, studies have failed to examine the measurement of stress impact on women exposed to constant violence and its associated exacerbated stress levels of pressure as a consequence of disguising the exposure to physical and psychological violence, balancing work, and family life responsibilities.

One study conducted by Smith (2005) of 132 women supports the relationship between life stress events and increased health risks for women exposed to domestic violence. This correlational study indicated that prevalence and symptom frequency in a range of health problems including clinical depression were significantly higher than standard estimates and that exposure to stress in a climate of implicit threat was substantial. Furthermore, the higher prevalence for health problems and frequency of life

events suggests that the negative features of partner abuse represent increased risk for major morbidity and mortality. One limitation of this study was the use of self-reports of health.

Given the depth and breadth of research worldwide on stress, on the effect of life events influencing health, more recent research studies have focused on chronic illness specifically cancer and life events (Spiegel, Bloom, Kraemer & Gottheil, 1989; Spiegel, Sephton, Terr & Stites, 1998). This has provided some evidence of the associations between intervening variables, threatening life events, stressors and diseases. Research suggests that cancer patients coping with life threatening illness often experience positive effects as a result of being actively involved in engagement-orientated coping strategies and experience positive change in self-concept, reduced psychological distress and lower rates of depression, thus improving quality of life (Jim, Richardson, Golden-Kreutz & Andersen, 2006). However, the evidence base remains ambiguous with difficulties noted these relate to research and complications with self-reports and other methodological flaws.

However, studies have established that some individuals may employ specific coping strategies in response to stressful situations. In coping with exposure to severe violence the role of specific coping styles is fundamental to stress outcome (Billings & Moos, 1981; Higgins & Endler, 1995; Lazarus & Folkman, 1984). There is much evidence that the incidence of psychiatric disorders relating to stressors in domestic violence namely, depression and

post-traumatic stress disorder have been found to be higher than in childhood sexual abuse (Coid, Petruckevitch, & Feder, 2001; Golding, 1999) or attempted suicides (Stark & Flitcraft, 1991, 1999).

3.4 Biology, Emotion and Stress

Ptacek, Smith and Zanas (1992) suggests a major source of stress, as much as 80% may be a direct product of interpersonal conflicts in relationships however, no conclusive evidence exists. In considering the contribution of stress in illness according to Steptoe (1991) we need to consider the underpinning relationships between stress, health and disease linked to several pathways involving the cognitive behavioural pathway, physiology of stress, and the mediating role of psychosocial stress by changes in the neuro-endocrine response which may be implicated in disease.

According to Cohen and Herbert (1996), the impact of stress on the nervous, endocrine, cardiovascular, and immune systems can cause negative emotional responses, which can effect the activation of stress responses in several ways such as heightened cardiovascular reactivity, increases in heart rate and heightened blood pressure (Adler & Matthews, 1994; Billings & Moos, 1981).

Based on the school of thought by Lazarus and Folkman (1984,1988) we identify stress when demands placed upon us and our ability to cope are no longer in balance. They argue that the coping process is complex in

establishing relationships between psychosocial factors and health, while living in a climate of implicit threat, the process of coping with stressful experiences can create a variety of health problems such as exaggerated blood pressure response, lowering of immune response and intense psychological distress (Cohen, 1996; Higgins & Endler, 1995; Steptoe, 1991). These physiological responses can have a significant impact on every system in the body for example, decreased immune functioning, diabetes, back-pain, headaches, eczema, and increased viral upper respiratory tract infections, and as Cohen (1996) have suggested may often be displayed as colds and influenza type symptoms (Billings & Moos, 1981). An individuals approach and the exact role of coping factors in situations of stressful events are inconclusive. The relationships between stress, health and illness involve relatively complex relationships (Craig & Brown, 1984; Creed, 1985; Grant, et al.,1989; Henry, 1986) .

Conclusion

The evidence reviewed in this chapter suggests that there are no easy solutions to measuring stress and the mechanisms of individual appraisals utilised in coping are complex. However the chapter provides an understanding as to why some individuals may be more susceptible to poorer health profiles than others. This chapter sheds light on how severe stress, an individual's personality and coping strategies may leave an individual with depleted resources thus vulnerable to disease risk.

3.5 The Research Question

As can be seen here, given that only half of first-time stroke can be explained by established risk factors such as hypertension and smoking, the balance of cases of underdetermined aetiologies remain relatively unexplained and unstudied (Malek, et al., 1999; Milligan & Anderson, 1980). The numbers of young women reporting stroke appear to be increasing therefore, we need to have an increased understanding of awareness and assessment for risk factors for stroke in primary prevention to reduce the burden of stroke in the young. The numbers of cases of stroke findings in young women are based on small numbers, usually related to medical case reports and anecdotal accounts which limits the conclusions that can be drawn. Although there is modest support for the view that stress may be one of the determinant risk factors for stroke the claim remains contentious because of the lack of methodologically sound studies to support this claim. This study aims to compare and extend the current findings for a UK population.

Finally, no previous study has examined the relationships between severely threatening life events, physical illness and factors associated with increased stroke risk in young women exposed to domestic violence. This study will explore the symptoms and incidence of first-ever stroke, including psychosocial aspects of abuse as well as the role of other risk factors for stroke. The study will examine the specific four-part research question below to explore psychosocial factors in stroke in terms of:

1. Identify the prevalence of stroke and stroke-related symptoms
2. Examine the profile of stroke sufferers
3. Explore both risk and psychosocial aspects of abuse
4. Study data matched for age and gender specific incidence rates for first-ever in a lifetime stroke with non-abuse population

CHAPTER IV: METHOD

4.1 Introduction

This chapter discusses the appropriate research methodology to address the research questions. Further, the chapter looks at the methods and tools used to collect the data for examining the relationships between domestic violence, perceived general health and mental health status. Measurement involves exploring the profile of stroke sufferers and considering risk and psychosocial aspects of abuse. Reliability and validity information for all instruments are presented. Last, the chapter discusses possible limitations as well as the potential to generalize the findings of this research.

4.2 Rationale for the Study

The purpose of this research was to reach a marginalised population of domestic abused women who are often underrepresented in national surveys. Due to the limitations of practical access to users of the service, this study was based on cross-sectional survey data aimed at answering the research questions regarding the relationship between disease risks factors. This information will provide a valuable insight in raising awareness and understanding of the prevalence, consequences and risk factors of domestic violence and the role of health psychology in informing practice. The drawback of the cross-sectional 'snapshot in time' method is that the study outcomes tend to be based on associations and not cause and effect relationships. Different authors have measured domestic violence in a variety

of ways including quantitative and qualitative measures using questionnaires, interviews and electronic formats (Campbell, 2002, 2008). It was considered that qualitative measures using face-to-face interviews would be valuable in supplementing and extending the analysis. However, due to the expected difficulty of ethical issues of accessibility to this population it was decided that quantitative measures utilising self-completion questionnaires would be the most feasible and practical way of collecting a larger data bank.

4.3 Participants

The sensitive nature of this domestic violence study raised important ethical and methodological concerns about the process of recruitment and determining how the survey questionnaire would be distributed. The study was conducted in line with rigorous ethical principles and necessitated building in safety plans and preserving the anonymity of eligible participants. This study sample consisted of 237 females aged between 18 and 56 years of age with previous involvement in a domestic violence relationship. This vulnerable hard-to-reach population were recruited through domestic violence major providers of site-based refuge accommodation across the United Kingdom. The comparison sample group included an age and gender-matched control group recruited from the Oxford community stroke project register of first ever in a lifetime stroke cases. The stroke data provided only contained information on women aged between 20 and 44 and therefore for comparison, only 209 women compatible for age were included in the cross-match procedure. Given the scale of the research, the survey was provided

in English language due to cost, and, simplified to assist those participants whose first language was not English. There was no provision for translation. The exclusion criteria were insufficient English language skills (reading and writing).

4.4 Measures

No suitable questionnaires could be found to explore the specific research questions because of the novelty and originality of this research. It was considered important to develop and test new measurement tools for health psychology research. The design of the newly developed questionnaire was devised and based on previously valid and reliable tested self-administered short form instruments. Overall the questionnaire was eight pages in length and divided into 4 sections focusing on areas of specific research interest which measured socio-demographic variables, health variables, illness symptoms and disease variables. Other questions focused on exploring the psychosocial aspects of abuse, exploring the profile of stroke sufferers and the history and mechanisms of injury experienced by women exposed to domestic violence. A short version of the general health questionnaire (GHQ-12) was supplemented to extend the measurement of the level of psychological distress found in this population.

The refuge organisations participated in an initial evaluation to pilot the questionnaires. In some instances, managers piloting the survey questionnaire declined to participate, as they were of the opinion that the

women currently staying in their refuge accommodation would not be suitable and that many of the women had recently participated in several research exercises. For others there was an expectation that this research may increase the profile of domestic violence as a major health issue and lead to improved services for women.

4.4.1 The Instruments

The newly developed survey questionnaire was divided into 4 sections, modified to include additional items is described in greater detail below.

(1, 2). *The Health Status Questionnaire; (HSQ-12, Roy, 1994; Smith, 2005)*

The self–reported health status instrument is a generic indicator of health status, used widely in population surveys and as an outcome measure in clinical practice and research. The instrument contains eight scales measuring aspects of physical and mental health and is a critical tool in measuring health disparities in populations. Findings regarding the internal consistency reliability of this instrument were found to be high 0.877 (alpha coefficients) and good test-retest reliability (ICC 0.94) (Roy, 1994). For this study, the instrument was further developed to include additional health constructs. The scale as used in the present study includes three sections: general health details, including age, and perceived general health. Rating their general quality of health on a five point Likert scale (e.g., 'excellent to very bad'); Personal health history, used to assess prevalence and symptom

frequency (e.g., 'daily, weekly, monthly, less often') across a range of health areas (e.g., migraine, diabetes, stiff neck tension, hypertension, sleep problems, bowel disorders) including use of oral contraception, prescription and non-prescription drugs; health Behaviours, including frequency of primary health care consultations, smoking, alcohol, diet, and physical activity. The self-reported illness and symptom occurrence asked about 15 areas of health conditions rating the illness symptom items on a five point likert scale (e.g., 'All the time to Never').

(3). *The History and Methods of Domestic Violence Questionnaire (Smith, 2007)*

This questionnaire was adapted from (Campbell, 2001) a previously tested instrument. The question derived from Danger Assessment-2 (DA-2) contains 19 items, measured on a scale ranging from one to five. The instrument assesses the occurrence and frequency of physical, psychological and emotional abuse. The instrument was adapted to contain 21 items with the addition of questions focusing on strangulation episodes to determine the incidence, medical symptoms experienced by victims of strangulation, and whether victims utilized medical health care settings as a result of the strangulation incident. The development of this instrument was also based on the protocol developed by San Diego District Attorney, Gael Strack and Emergency Physician Dr. George McClane (2001), who focus on domestic violence strangulation injuries in surviving patients and homicide cases. Interpretations of the answers relating to injury are based on recorded answers of "yes", or "no". The occurrence within the cycle of domestic

violence was measured by including questions to identify the escalation of the violence (did the level of violence increase over time). Findings regarding the internal consistency reliability of this instrument, reported by (Campbell, 1992), range from 0.60 to 0.86 (alpha coefficients). However, the author notes that lower coefficients occurred in studies where sample sizes were smaller. Convergent construct validity is supported by correlations with other abuse assessments (Abuse Assessment Screen and the Conflict Tactics Scales) and internal scales (injury severity and violent tactics) (Campbell, 1992).

(4). ***General Health Questionnaire; (GHQ-12, Goldberg, 1992)***

The GHQ-12 is a brief and easy to complete self-reported questionnaire used to detect states of depression and psychiatric morbidity (Goldberg & Williams, 1988). The GHQ-12 is a shortened version of the well-validated full version GHQ-60. The 12-item version is equally as valid and reliable as the longer version and has been extensively used for over a decade in general population health surveys including the Health Survey for England (Goldberg, 1992). The questionnaire is used to detect the current presence of psychological distress and if that differs from the informants usual state. The instrument cannot be used for diagnosis purposes. The questionnaire comprises of 12 questions and asks whether the informant has experienced a particular symptom over the last four weeks. The GHQ-12 has two scoring systems the bimodal with a scoring range of 0-12 and the likert scoring system with a score range of 0-36 which assess severity. Interpretation of

the detection case answers are based on a four-point response scale using a bimodal method (0-0-1-1) using scores ranging from 0 to 12 ('not at all' = 0, 'no more than usual' = 0, 'rather more than usual' = 1, 'much more than usual' = 1,). Higher scores are indicative of clinical disorder (Goldberg, 1992). The Likert scoring style (0-1-2-3) is used for comparing the degree of disorder and responses are scored ('more so than usual' = 0, 'same as usual' = 1, 'less so than usual'= 2, 'much less than usual' = 3). The threshold score widely used in UK Health survey for detecting potential psychiatric morbidity is four. Thus, this study used a score of four as the cut-off (Goldberg et al., 1997). Previous literature suggests that somatic symptoms are generally reported to be higher in the domestic violence population (Campbell, 2002; Higgins & Endler, 1995). For the purposes of this survey, a score greater than four is taken as an indicator of potential psychological disorder to account for somatic symptoms, which can inflate scores. Findings regarding internal consistency as assessed by Cronbach's alpha ranged from 0.82 to 0.90 in a series of studies (Goldberg, 1992). The test-retest reliability was 0.73. Validity has been evaluated by assessing its sensitivity in detecting cases of psychiatric disorder. It shows a high degree of sensitivity.

4.5 Procedure

Prior to commencing the study, ethical clearance was sought and subsequently approved and given a favourable ethical opinion for conduct in the (private sector) by the Queen Margaret University Research Ethics Committee and approved by the participating managers in the refuge

services. The ethical issues and inherent risks in conducting domestic violence research are outlined at Appendix 1. A comprehensive resource detailing the search engines used for the literature searches can be found at Appendix 2.

Recruitment was attempted in several ways. Initially, contact was made explaining the nature of the proposed research and inviting participation of both, Professor Peter Rothwell, of the Stroke Prevention Unit, Oxford Community Stroke Project and Nicola Harwin CBE, Chief Executive of Women's Aid Federation of England. Professor Rothwell agreed to provide comparative data with respect to age and gender factors from the Oxford Community Stroke Project, (OXVASC) database of first ever in a lifetime stroke with the results from this survey. The cross-match of information would act as a control in which to estimate the expected risk of strokes per year in a group of women of the same age. This information would allow us to investigate the associated risk factors for onset of stroke in young women exposed to domestic violence.

Following the initial contact with the Chief executive and Dr Jackie Barron Research Policy Officer of Women's Aid Federation, it was apparent that head office would be unable to assist with distribution of survey packs. At a second stage of recruitment, Women's Aid groups at both regional and national level across the United Kingdom were approached by use of individual emails explaining the study (Appendix 3) so as to reduce postage

costs. Brief details outlining the study invited managers who expressed an interest in this national survey to contact the researcher by email for further details. Refuge organisations with no email address listed were alternatively contacted via telephone.

The data collection process ran from March 2007 through to February 2008. The survey pack consisted of a questionnaire accompanied by a covering letter, information sheet that explained the study and a postage paid envelope for returning the questionnaire. The cover letter explaining the rationale for the survey did not indicate the exact nature of the study. The study was explained as a study on 'women's health'. Managers handing out the survey at the domestic violence services explained the questionnaire and the exact nature of the study as part of the consent procedure and answered any questions. The researcher obtained a copy of The UK Gold directory published by Women's Aid, which acted as a key resource in providing contact details for over 500 Domestic Violence Services and National network of refuges. Unique region codes were recorded on the questionnaires which assisted in distinguishing the response rates from the individual Women's Aid federation regions across the UK. Protecting confidentiality was fundamental both to the women's safety and data quality. All data was stored in a locked cabinet to preserve anonymity. A PO Box address funded by the researcher was set up with royal mail to allow for free anonymised returns of questionnaires.

A total of 127 Women's Aid Federation (WAF) Domestic Violence Services and Refuges were approached across England from (Edinburgh) in the North to (Plymouth) in the South. In total forty-eight organisations (37%) agreed in principle to distribute the questionnaires. The survey pack was actually distributed across the UK by 39 Women's Aid refuge and domestic violence services (31%) this is within the average for survey data. Regular communication assisted in determining the numbers of questionnaires to be distributed to each office, this information assisted in budgeting available resources. The organisations expressing an interest in the study were provided with a questionnaire booklet comprising; cover letter, copy of the Participant Information Sheet, Consent Form and survey questionnaire (Appendix 4). Permission was obtained from Women's Aid groups to manage the questionnaires to preserve anonymity and act as gate-keepers in recruitment of participants.

Initially, 1,200 questionnaires were distributed an average of twenty-five questionnaires per organisation. The majority of questionnaires were posted out to organisations. Although several organisations requested an electronic copy of the survey and kindly agreed to print and distribute the survey pack. This assisted in reduction of administration and costs. Distribution took place between March and April 2007. Between August and October 2007, reminders were sent out. A second mailing was made of a further 350 questionnaires to organisations requesting more questionnaires and to areas of the country in which none had been returned. According to feedback from

individual organisations, the calculations suggested that at least 548 returns could be expected from both mailings. An initial sample size of 442 had been calculated using a priori power analysis. On the basis of a lower than expected return rate of 30% from the 1,550 questionnaires distributed, an expected return rate of 465 questionnaires had been calculated. At the closing date for questionnaire return in February 2008, a total of 237 questionnaires had been returned from the 1550 distributed a return rate of 15.3%. The lower response rates could be partly explained by this survey coinciding with Women's Aid's own research data collection programme. Data management and analysis was performed using SPSS version 13.0 (2007) discussed in detail in the results section.

4.6 Limitations of the Research

The questionnaire approach in this cross-sectional survey allowed reaching a wide audience. However a low response rate is problematical. It is doubtful findings can be generalised and in view of ethical concerns, best suited the preliminary nature of the research. It was considered that self-report questionnaire measures are the least intrusive approach for sampling a population asked to participate in numerous surveys. A common disadvantage of the quantitative method is that individual experiences are unlikely to be adequately described and answers may be incomplete and more prone to response biases. It was considered that the best method to adopt for this investigation would be a mixed design combining both quantitative and qualitative methods. As a result of ethical concerns relating

to qualitative interviews it had not been a feasible option. Whilst the probing qualitative interview has the advantage of managing more complex questions and providing a richness and greater insight into the dynamics settings, and contexts; it can only be undertaken on small scale; therefore, not appropriate for dissemination.

CHAPTER V: RESULTS

5.1 Introduction

This chapter explores the data from the questionnaires using SPSS version 13.0 for windows. The chapter explores the demographic data and the research questions elicited in chapter 3.

The demographic data will be addressed first then the specific four part research question under study will be explored: e.g.

- 1. Identify the prevalence of stroke and stroke-related symptoms.
- 2. Examine the profile of stroke sufferers.
- 3. Explore both risk and psychosocial aspects of abuse.
- 4. Study data matched for age and gender specific incidence rates for first-ever in a lifetime stroke with non-abuse population.

Factor analyses were performed on the questionnaires and their reliability as an investigative tool inspected. Only significant data has been included in the results section.

5.2 Descriptive Analysis of Data

Initially summaries of all the demographic variables were produced generating a range of information on the population characteristics. Whenever possible, normative data was presented in the analysis. The continuous measures were all found to be approximately normally distributed, and were summarised by the mean and standard deviation. Categorical variables were summarised by the number and percentage in each category. The mean age of the female study sample was 34 years (SD=7.7).

Examination of the geographical response rates for the survey indicated a higher concentration response rate from cities possibly, explaining locations of the refuge accommodation. The figures on population by ethnic group (classification based on White, Asian or Asian British 4%, Black or Black British or ethnic minority group 3%) indicated a high proportion (94%) of the survey sample were predominantly white, these figures were representative of the normal population of the United Kingdom The low response rate from other ethnic groups may be explained by several possible reasons (e.g. barriers of native language - unable to read English). The socio-economic status for this sample indicated that the highest proportion of women 54% were unemployed and 14% unable to work as a result of ill health. Given the multitude of reported chronic diseases and severity of symptoms within this dataset 49% perceived their general health status to be 'fair' and 33% perceived their health as 'good'.

Categorical variables were surmised by the number and percentage in each category. Subsequently associations between pairs of variables were examined. Associations between two categorical variables were examined using the Chi-square test. The exception was for variables where some categories were small in number, and in those situations Fisher's exact test was preferred. Other analyses involved the comparison of age between several groups. The grouping variables contained more than two groups, and so analysis of variance (ANOVA) was used for the analysis. A number of the categorical variables contained a relatively large number of categories, and

for some of those variables, there was a relatively small number in each category. Therefore, to increase the power of the tests, and to ease interpretation of the results, some similar categories were combined together for the purposes of the statistical analyses (eg., ethnicity, alcohol/how often, violence affected health). The first table shows a summary of the variables that were measured on a numerical scale. The figures show the mean and standard deviation for each measure.

Table 1

Demographic Variables for Age, Height, Weight

Variable	Mean	Standard Deviation
Age (years)	34.1	7.7
Height (inches)	65.4	2.4
Weight (stones)	10.0	1.7

Table 1 indicates that the women were young women with little deviation from the mean for height and weight.

The second table shows summaries of the categorical variables and the figures represent the number and percentage of women falling into each category engaging in health-related risk behaviours.

Table 2

Prevalence of Smokers within Sample compared with the normal population

	Smoke (%)		Average daily consumption Cigarettes (No.)		Average Years Smoked
	Sample	Normative*	Sample	Normative*	Sample
Yes	61.6	22	17.65	12.85	14.80
No	37.1	77	-	-	-

**** Source: Office for National Statistics UK Health Statistics No3 2008***

The highest proportion of current smokers in this sample 62% represented a large disparity with the national population data at 22%. The current smokers smoked on average 18 or more a day compared with normative data of 13 a day. The regular smokers in the sample reported smoking for 15 years or more. The findings for those engaging in drug use are summarised in Table 3 below.

Table 3

Drug Use within Sample

Drug use	Prescribed	Non-Prescribed (Illegal)
	N (%)	N (%)
Yes	66 (27.8)	37 (15.6)
No	171 (72.2)	200 (84.4)

28% of the sample reported taking prescribed drugs with 16% reporting non-prescribed (illegal) drug use.

Table 4 presents summaries of alcohol consumption within the sample.

Table 4

Daily Consumption of Alcohol in Units compared with the normal population

	Alcohol (%)	
Consumption in units	Sample	Normative*
None	50.6	44
Less than 3 units	18.6	33
3 – 6 units	25.3	10
7+ units	5.5	14

**** Source: Office for National Statistics UK Health Statistics No3 2008***

The highest proportion 51% of this sample reported not drinking any alcohol compared with 44% of normative data from the UK. The data indicated that 25% of the sample reported drinking 3-6 units of alcohol daily which formed a large disparity compared to 10% of normative data. The heaviest drinkers 6% of the sample drank 7 units or more daily although lower than the 14% reported within the national population.

5.3. Research Question Part 1: Identifying the Prevalence of Stroke and Stroke-Related Symptoms

The first set of analyses undertaken comprised the first part of the research question to evaluate the occurrence of stroke and stroke-related symptoms in this sample. Five women (2%) were identified as stroke cases of which the mean age and type of stroke are presented in Table 5.

Table 5

The Occurrence of First Stroke in Sample

Stroke			Stroke Type		Individual Ages (25,26,31,35,40)
	N	(%)	Ischemic	Hemorrhagic	Mean Age (years)
Yes	5	(2)	3 (60%)	2 (40%)	31.4
No	227	(96)	-	-	-

Further analyses in the dataset observed the relationships between a range of clinical variables associated with widely recognised stroke-related signs and symptoms. Ischemic stroke symptoms show similarities with those of hemorrhagic stroke therefore symptoms were measured collectively. The aim of all analyses were to examine factors associated with strokes for all of the following; paralysis, eyelid drooping, disturbed vision, loss of memory, swallowing problems, dizziness, headache/blackout, loss consciousness, migraine and high blood pressure. Almost all factors categorical, therefore, Fisher's exact test was used for the analyses. This test was preferred to the Chi-square test, which is sometimes used for this type of data, due to the small number of strokes. The exception was for a few variables that were measured on a continuous scale. Here the method used was dependent on the distribution of the continuous measurement. If the variables were normally distributed, the unpaired t-test was used to compare values between women with and without a stroke. For non-normally distributed variables the Mann-Whitney test was used for the analysis. The findings are presented in Table 6.

Table 6

Proportion of Stroke-Related Symptoms Among Sample

Variable	Category	No Stroke N (%)	Stroke N (%)	P-value
Paralysis	No	210 (99%)	3 (1%)	**<0.001**
	Yes	1 (33%)	2 (67%)	
Loss of memory	No	211 (99%)	2 (1%)	**<0.001**
	Yes	0 (0%)	3 (100%)	
Loss consciousness	No	209 (99.5%)	1 (0.5%)	**<0.001**
	Yes	2 (33%)	4 (67%)	

The results indicated that eyelid drooping, loss of memory, loss of consciousness were all associated with stroke occurrence. The results indicated that 67% of women who experienced paralysis also had a stroke, whilst only 1% of with no paralysis had a stroke. All women who had a loss of memory experienced a stroke, but only 1% of women who did not experience memory loss had a stroke. The data indicated that 67% of women who experienced loss of consciousness had a stroke, compared to only 0.5% of women who did not experience loss of consciousness.

5.4. Research Question Part 2: Exploring the Profile of Stroke Sufferers in Sample

Analyses were performed to examine the relationships between various variables in the dataset associated with the profile of the five stroke sufferers in this sample presented in Table 7.

Table 7

Stroke Sufferers Profile

Health Status Assessment Self Reported				History and Type of Domestic Violence		
Variable	Category	N (%)		Variable	Category	N (%)
Employment	Unemp/ill	**5 (100)**		1st Exp DV	1st Met	1 (20)
					1st Go Out	2 (40)
					1st Married	1 (20)
					Pregnant	1 (20)
Health Status	Good	1 (20)		Inc Violence	Yes	**5 (100)**
	Fair	**4 (80)**				
Last Consult GP	Last Mth	**4 (80)**		Visit Health Professional	Yes	**5 (100)**
	6 mths	1 (20)				
Smoke	Yes	**5 (100)**		Disclosed Violence	Yes	**4 (80)**
Per wk	140+	**4 (80)**				
				Asked if DV	Yes	**3 (60)**
Yrs Smoked	15 - 30	**5 (100)**				
Eat Healthy	No	**4 (80)**				
Violence affect health	Yes	**5 (100)**		Strangled	Yes	**5 (100)**
Alcohol	Yes	**3 (60)**		No of times strangled	Under 5	2 (40)
	No	2 (40)			5 to 10	1 (20)
					10+	2 (40)
Frequency	1-2 days wk	2 (40)				
	Daily			How Strangled	Manual One or two hands	**5 (100)**
	3	1 (20)				
Units Daily	4+	2 (40)				
		1 (20)				
Illegal Drug	Yes	**2 (40)**		Breathing Problems	Yes	**5 (100)**
Migraine	Yes	**3 (60)**		Throat Swell	Yes	**5 (100)**
Disturbed Vision	Rarely	2 (40)		Neck /Throat Pain	Yes	**5 (100)**
	More often	**3 (60)**				
Back/Jt/Muscle	Yes	**4 (80)**		Dizzy	Yes	**5 (100)**
Clinical Depr	Yes	**5 (100)**		Faint	Yes	**3 (60)**
Hdache/Bkout	Rarely	2 (40)		Loss Consc	Yes	**3 (60)**
	More often	**3 (60)**				
Stiff neck Tension	Yes	**5 (100)**		Swallow Prob	Yes	**4 (80)**
Sleep Problem	Yes	**4 (80)**		Hoarse/Raspy	Yes	**5 (100)**
Bowel	Yes	**3 (60)**		Memory loss	Yes	**3 (60)**
GHQ - Distress	Yes	**4 (80)**				

Bold items represent majority sample stroke sufferers

Further analyses were performed to examine the association between stroke and exposure to strangulation as a risk factor. The associations for categorical variables were performed using Fisher's exact test, due to the small number of strokes. The results are summarised in Table 8.

Table 8

Correlations Between Stroke and Strangulation as a Risk Factor

Variable	Category	No stroke N (%)	Stroke N (%)	P-value
Loss of conscious. (⊥)	Yes	2 (33%)	4 (4%)	**<0.001**
	No	161 (99%)	1 (1%)	
Paralysis (⊥)	Yes	1 (33%)	2 (67%)	**0.002**
	No	162 (98%)	3 (2%)	
Vomit (⊥)	Yes	7 (78%)	2 (22%)	**0.02**
	No	163 (98%)	3 (2%)	
Loss memory (⊥)	Yes	2 (40%)	3 (60%)	**<0.001**
	No	161 (99%)	2 (1%)	

(**) Median and inter-quartile range reported. Analysis using Mann-Whitney test
(⊥) Analyses for those who were strangled only

The analysis results indicated that, for those who were strangled, there was a significant association between each of paralysis; vomiting, and loss of memory with the occurrence of a stroke. In each case those with each of the symptoms were evaluated to be significantly more likely to have a stroke than those without a symptom. For example, 60% of women with loss of memory had a stroke, compared to only 1% of women with no loss of memory. A possible next stage would be to perform a multivariate analysis to examine the joint effect of these factors upon the occurrence of a stroke. However, the small number of strokes precluded such an analysis. Further analysis was

performed to identify any associations between recognised risk factors for stroke with the remainder of the sample, which are summarised in Table 9.

Table 9

Correlations Among Proportion of Sample Not Reporting Stroke with Established Stroke Risk Factors

Variable	Category	No Stroke N (%)	Stroke N (%)	P-value
Family hist. stroke	No	212 (98%)	4 (2%)	0.09
	Yes	3 (75%)	1 (25%)	
High BP	No	208 (98%)	4 (2%)	1.00
	Yes	9 (100%)	0 (0%)	
Smoking	No	81 (100%)	0 (0%)	0.16
	Yes	133 (96%)	5 (4%)	
Alcohol	No	97 (98%)	2 (2%)	1.00
	Yes	114 (97%)	3 (3%)	
Contraception	No	151 (99%)	2 (1%)	0.18
	Yes	66 (96%)	3 (4%)	
Eat Healthily	No	76 (95%)	4 (5%)	**0.06**
	Yes	136 (99%)	1 (1%)	
Non-prescribed Drugs (Illegal)	No	185 (98%)	3 (2%)	0.17
	Yes	32 (94%)	2 (6%)	
Exercise	Daily	135 (99)	1 (1%)	**0.07**
	Less than daily	79 (95%)	4 (5%)	
Migraine	Never/rarely	86 (98%)	2 (2%)	1.00
	Sometimes-all time	129 (98%)	3 (2%)	
Diabetes	No	213 (98%)	5 (3%)	1.00
	Yes	4 (100%)	0 (0%)	
Cardiovascular	No	202 (99%)	3 (1%)	1.00
	Yes	5 (100%)	0 (0%)	
Weight (*)	-	10.1 (1.8)	8.8 (0.8)	0.12

(*) Mean (standard deviation) reported. Analysis using unpaired t-test

There was no strong evidence that any of the recognised stroke risk factors were associated with the occurrence of a stroke. There was slight evidence that not eating healthily and exercising less than daily were associated with a stroke, but these factors were not quite statistically significant (p=0.06 and p=0.07 respectively).

5.5. Research Question Part 3: Risk and Psychosocial Aspects of Abuse

This set of analyses was conducted to evaluate risk and psychosocial aspects of women exposed to domestic violence. Increased risk of stroke is implicated with risk factor exposure status thus Table 10 below evaluates such factors.

Table 10

Risk and Psychological Aspects Stroke and No Stroke

Variable	Category	No Stroke Number (%)	Stroke Number (%)	P-value
Clinical depression	Never/mild	70 (99%)	1 (1%)	0.73
	Moderate	90 (98%)	2 (2%)	
	Severe	51 (96%)	2 (4%)	
Alcohol	No	97 (98%)	2 (2%)	1.00
	Yes	114 (97%)	3 (3%)	
Smoking	No	81 (100%)	0 (0%)	0.16
	Yes	133 (96%)	5 (4%)	
Non-prescribed drugs	No	185 (98%)	3 (2%)	0.17
	Yes	32 (94%)	2 (6%)	
Eating disorder	Never/rarely	122 (99%)	4 (3%)	1.00
	Sometimes-all time	52 (98%)	1 (2%)	

Table 10 (*continued*). *Risk and Psychological Aspects Stroke and No Stroke*

Contraception	No	151 (99%)	2 (1%)	0.18
	Yes	66 (96%)	3 (4%)	
Relationship time (**)		8 (5, 8)	8 (8, 9)	0.63
Strangled	No	56 (100%)	0 (0%)	0.33
	Yes	155 (97%)	5 (3%)	
Migraine	Never/rarely	86 (98%)	2 (2%)	1.00
	Sometimes-all time	129 (98%)	3 (2%)	
Disturbed vision	Never/rarely	148 (99%)	2 (1%)	0.33
	Sometimes-all time	67 (66%)	3 (4%)	
Asthma	No	178 (98%)	3 (2%)	0.22
	Yes	37 (95%)	2 (5%)	
Eczema	No	198 (98%)	3 (1%)	**0.05**
	Yes	15 (88%)	2 (12%)	
Back joint	Never/rarely	80 (99%)	1 (1%)	1.00
	Sometimes-all time	121 (98%)	3 (2%)	
Sleep problems	Never/rarely	58 (98%)	1 (2%)	1.00
	Sometimes-all time	154 (97%)	4 (3%)	
Bowel disorder	Never/rarely	116 (97%)	4 (3%)	0.39
	Sometimes-all time	90 (99%)	1 (1%)	
Cardiovascular	No	202 (99%)	3 (1%)	1.00
	Yes	5 (100%)	0 (0%)	
High BP	No	220 (98%)	5 (2%)	1.00
	Yes	10 (100%)	0 (0%)	
GHQ (grouped)	No distress	62 (98%)	1 (2%)	0.66
	Distress	112 (97%)	4 (3%)	
GHQ (*)	-	17.0 (7.3)	20.0 (7.6)	0.36

(*) Mean (standard deviation) reported. Analysis using unpaired t-test

(*) Median (inter-quartile range) reported. Analysis using Mann-Whitney test

The results indicated some evidence of a significant association between eczema and a stroke, however, the sample size does not allow us to draw conclusions from this, especially as the significance was only p=0.05. No other factors were associated with a stroke. Further analyses to explore risk aspects were performed to evaluate associations between various other variables in the dataset with no differentiation between stroke and no-stroke. The first set of analyses examined the association between the health status of the women in the study, and a number of other measures. The analyses were performed using the Chi-square test, and the results are summarised below. The figures are the number (and percentage) of subjects in each health group taking each response and p-values from the analyses are summarised in Table 11 below.

Table 11

Associations of Perceived Health Status and Frequency of Health Professional Contact & Exercise among sample

Variable	Category	Excellent/Good N (%)	Fair N (%)	Poor N (%)	P-value
Last seen GP	Last week	3 (4%)	37 (32%)	27 (71%)	**<0.001**
	Last month	18 (24%)	50 (40%)	10 (26%)	
	Last 6 months	11 (15%)	14 (12%)	0 (0%)	
	More than 6 months	44 (58%)	14 (12%)	1 (3%)	
Times seen GP in year	More 1/month	3 (4%)	69 (61%)	35 (90%)	**<0.001**
	Less 1/month	60 (78%)	44 (39%)	4(10%)	
	Not at all	14 (18%)	0 (0%)	0 (%)	
Exercise	Daily	52 (66%)	77 (68%)	16 (40%)	**0.02**
	Less daily	18 (23%)	22 (19%)	13 (33%)	
	Never	9 (11%)	15 (13%)	11 (27%)	

The analyses indicated a significant association between health status and each of the three variables examined. The figures indicated that 71% in poor health had seen a GP in the last week, and 90% had seen a doctor more than once a month in the last year but the equivalent figure was only 4% in the excellent/good health group. The results for exercise indicated similar results for the good/excellent and fair health groups, but differing results for the poor group. Twenty-seven percent of those in the poor health group never took any exercise, whilst this figure was lower at 11% and 13% respectively in the other two groups.

The Chi-square test and Fisher's exact test were used to examine associations with smoking status, with the results displayed from a chi-square test unless indicated otherwise. The figures show the number and percentage of subjects taking each response for each smoking category, along with the p-values from the analyses. Table 12 below represents the frequency among the sample engaging in common health related risk behaviours associated to stroke risk factors.

Table 12

Associations Between Contraception use Alcohol and Smoking status and High Blood Pressure as risk factors for stroke

Variable	Category	Smoker N (%)	Non-Smoker N (%)	P-value
Consume Alcohol	Yes	74 52%)	48 (56%)	0.49
	No	69 (48%)	37 (44%)	
High BP (*)	Yes	4 (3%)	6 (7%)	0.18
	No	141 (97%)	81 (93%)	

Table 12(*continued*). Associations Between Contraception use Alcohol and Smoking status and High Blood Pressure as risk factors for stroke

Variable	Category	Smoker N (%)	Non-Smoker N (%)	P-value
Contraception	Yes	55 (38%)	17 (19%)	**0.003**
	No	91 (62%)	71 (81%)	

(*) Analysis using Fisher's exact test

The figures indicated no significant association between smoking status, alcohol consumption or high blood pressure. However, there was a significant association with contraception. Those who smoked were more likely to use contraception, with 38% of smokers using contraception compared to only 19% of non-smokers using contraception independent of age. The next set of analysis in Table 13 examined the association between the use of contraception and high blood pressure, and the results are summarised below. The figures reported are the numbers (%) of subjects falling into each blood pressure category for each contraception group. The p-values are from the Chi-square test unless stated otherwise.

Table 13

Relationships between Proportion of Contraception users & High Blood Pressure including family history BP status

Variable	Category	Contraception N (%)	No Contraception N (%)	P-value
High BP (*)	Yes	0 (0%)	10 (6%)	**0.04**
	No	71 (100%)	154 (94%)	
Family history of high BP	Yes	24 (33%)	72 (44%)	0.12
	No	48 (67%)	91 (56%)	

(*) Analysis using Fisher's exact test

The results indicated a significant association between contraception and high blood pressure. No subjects on contraception had high blood pressure, whilst 6% of subjects without contraception had high blood pressure. There was no significant association between family history of high blood pressure and contraception. It must be borne in mind that this sample was very small and no conclusions can be drawn from the data.

The final analysis examined if the age of the women varied by health status and whether violence had affected health. The results indicated no evidence of an association between both health status and age, or between whether violence has affected health and age.

Analyses were performed to examine the associations between health condition variables the symptom frequency and the presence or absence of a family history of the same condition. The analyses were performed using the Chi-square test, unless otherwise indicated, where Fisher's exact test was used. The analysis results are summarised in table 14. The figures are the number (and percentage) of subjects in each category who do and do not have a family history of the same condition. The p-values from the analyses are also reported.

Table 14

Relationships Between Symptom Frequency of Physical illnesses among individual and Family History

Variable	Category	Family history Number (%)	No history Number (%)	P-value
Migraine	All the time	14 (93%)	1 (7%)	**<0.001**
Asthma	Severe	9 (82%)	2 (18%)	**<0.001**
Eczema Psoriasis (*)	Severe or Mild	13 (68%)	6 (32%)	**<0.001**
Allergy	Severe or Mild	22 (76%)	7 (24%)	**<0.001**
Diabetes (*)	None Type I or Type II	10 (5%) 4 (100%)	210 (95%) 0 (0%)	**<0.001**
Depression	Severe	16 (64%)	9 (36%)	**0.009**
Headache	All the time	9 (82%)	2 (18%)	**0.009**
Stiff neck	All the time	15 (58%)	11 (42%)	**0.01**
Bowel disorder	All the time	13 (68%)	6 (32%)	**0.005**
Cardiovascular (*)	No Yes – any	18 (9%) 4 (100%)	187 (91%) 0 (0%)	**<0.001**

(*) Analysis performed using Fisher's exact test

The analyses indicated a significant association between individual and family history for each condition for all of the following; migraine, disturbed vision, asthma, eczema psoriasis, allergy, diabetes, depression, severe headache, stiff neck, bowel disorder, and cardiovascular disease. In each case, women with stronger symptoms were significantly more likely to have a family history than those with weaker or absence of symptoms. Again no firm conclusions may be drawn from this small sample.

The length of time in a domestic variable was compared between different relationship status groups. This data was not normally distributed, and there were several relationship groups, the Kruskal-Wallis test was used for the analysis.

A majority of the women in the study reported suffering strangulation episodes and it was considered important to conduct further investigations to evaluate the relationships. The final analysis method was used to examine if there was a difference in the occurrence of a strangulation injury and the occurrence of women reporting that they had been strangled. This can be regarded as two different measurements of a single outcome, and so can be regarded as paired data. Therefore, the McNemar test was used to test this hypothesis.

This variable was not found to be normally distributed, and so the median and inter-quartile range (the interval containing the middle half of the data) was used to summarise the results. An illustration of the distribution of the measurements for this variable is given in the histogram Figure 1.

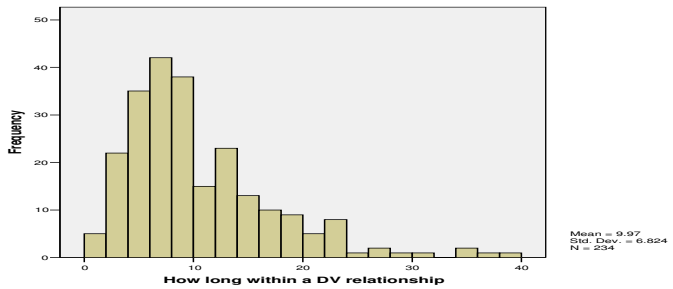

Figure 1: Length of time in domestic violence relationship

Secondly, summaries of the categorical variables are shown, firstly for those variables not involving strangulation in Table 15 below.

Table 15

Types of Abuse and Mechanisms of Injury Experienced among Sample

Variable	Category	Number	Percentage
Main perpetrator partner	Yes	234	99%
Type of abuse	Psychological	225	95%
	Physical	228	96%
	Financial	198	84%
	Sexual	199	84%
	Emotional	229	**97%**
	Other	3	1%
First experience dv	First met	25	11%
	Going out	37	17%
	Engaged	11	5%
	First married	27	12%
	First living together	33	15%
	First year	42	19%
	First 5 years	37	17%
	When pregnant	8	4%
Level of violence increase over time	Yes	231	98%
	No	5	2%
Visible injuries	Yes	218	93%
Type visible injury (*)	Bruise	155	72%
	Black eye	32	15%
Visit to health Professional	Yes	149	65%
	No	81	35%
Health professional visited (**)	Doctor	78	54%
	A&E department	37	26%
Disclose cause of Injury (**)	Yes	65	43%
	No	85	57%
Asked how injury caused (**)	Yes	118	79%
	No	31	21%

Table 15 (*continued*). *Types of Abuse and Mechanisms of Injury Experienced among Sample*

Variable	Category	Number	Percentage
Contact details provided for help (**)	Yes	60	41%
	No	87	59%
Physical injury sustained	Reddening to skin	103	46%
	Graze	79	35%
	Bruise	207	92%
	Swelling	185	82%
Type of body most Assaulted (***)	Head	144	66%
	Neck	99	45%
	Face	130	59%
How was injury caused	Slap	105	49%
	Punch (closed hand)	198	93%
	Kick	71	34%
	Strangle	164	71%
	Cigarette	77	36%

(*) Figures only for those with visible injuries
(**) Figures only for those who visited a health professional
(***) Figures only for those undergoing physical injury

The remaining categorical variables regarding strangulation are presented in Table 16 below.

Table 16

Frequency of Variables Against Strangulation

Variable	Category	Number	Percentage
Strangled	Yes	169	73%
Admitted to hospital (⊥)	Yes	5	3%

Table 16 (*continued*). *Frequency of Variables Against Strangulation*

Variable	Category	Number	Percentage
Number of times strangled (⊥)	Once	15	10%
	Twice	45	31%
	Four	15	10%
	Five to ten	25	17%
	Ten and over	46	32%
How strangled (⊥)	Manual one/two hands	163	97%
Shaken (⊥)	Yes	128	76%
Difficulty breathing (⊥)	Yes	170	99%
Swelling of throat (⊥)	Yes	152	89%
Experience neck pain (⊥)	Yes	175	100%
Experiences as a result of being strangled (⊥)	Dizziness	158	94%
	Faint	121	72%
	Loss of consciousness	6	4%
	Pain in throat	156	93%
	Eyelid drooping	4	2%
	Paralysis	3	2%
	Loss of bowel	2	1%
	Vomit	9	5%
	Swallowing problems	129	77%
	Breathing problems	159	95%
	Irregular heartbeat	3	1%
	Hoarse/raspy voice	148	88%
	Loss of memory	5	3%

(⊥) Figures for those admitted strangled only

Additional analyses examined the association between demographics of; age, height and weight and length of time in a domestic violence relationship. Three of the demographics were measured on a continuous scale, and the association with the length of time was assessed using Pearson correlation. The analysis results are summarised opposite in Table 17, where the figures are the correlation coefficients and corresponding p-values.

Table 17

Demographics Correlated With Time In Domestic Violence Relationship

Variable 1	Variable 2	Correlation Coefficient	P-value
Time in a DV relationship	Age	0.73	**<0.001**
	Height	-0.10	0.14
	Weight	0.18	**0.01**

There was a strong positive correlation between the time in a DV relationship and age, indicating that older women were more likely to have spent more time in such a relationship. There was also some suggestion that heavier women were also more likely to have spent more time in a DV relationship. There was no association with height.

The next set of analyses examined the association between when violence started and the occurrence of various types of abuse, and whether violence increased over time. The results of the Chi-square tests are summarised in Table 18. The figures are the numbers (percentages) in each type of violence started group falling into each category.

Table 18

Associations With Abuse Type and Onset of Violence

Variable	Category	Short period N (%)	Long period N (%)	Pregnant N (%)	P-value
Physical abuse	Yes	104 (100%)	103 (95%)	7 (88%)	**0.03**
	No	0 (0%)	5 (5%)	1 (13%)	

The analyses indicated a significant association between when the violence started and physical abuse. All of those where violence started early in the

relationship had physical abuse, however, 95% of those where violence started later also suffered physical abuse. The lower occurrence was when violence started during pregnancy, but this figure was based on very small numbers.

The next analysis used the Chi-square test to examine the association between the visible injury experienced and whether a visit was made to see a health professional. The figures reported are the number (%) who saw a professional for each type of injury, and the p-value from the Chi-square test. The results indicated that there was no significant association between the injury received and whether or not a visit was made to a health professional.

Analyses were also performed to examine the association between whether or not the women were asked how the injury was caused, whether they disclosed violence and if they had been provided with contact details of other agencies. Analyses were performed using Chi-square test, and the results are summarised in Table 19.

Table 19

Associations of Screening for domestic violence, Disclosure and referral information provided

Variable	Category	Asked how caused Number (%)	Not asked Number (%)	P-value
Disclose cause	Yes	51 (43%)	14 (45%)	0.85
	No	67 (57%)	17 (55%)	
Contact details help provided	Yes	54 (47%)	6 (19%)	**0.006**
	No	62 (53%)	25 (81%)	

The results showed that there was no association between whether the health professional asked how the injury was caused and whether the women disclosed the injury cause. However, there was a significant association between being asked about the cause of injury and whether contact details for seeking help were provided. When women were asked about cause of injury, they were more likely to be provided with contact details about help. Forty-seven percent (47%) of women were given contact details in the group asked how the injury was caused, but the equivalent figure was only 19% in the group not asked about injuries.

The next set of analyses examined a number of strangulation variables and the method of strangulation. The analyses were performed using Fisher's exact test. [Note that it was not possible to perform an analysis for neck pain, as all women had reported neck pain]. The results indicated no difference between strangulation methods. However, it should be noted that the numbers are small, and so this may influence the lack of significance.

Analyses were performed to examine the association between certain symptoms that occurred as a result of being strangled and presented in Table 20.

Table 20

Association Between Symptom Risk as a Result of Strangulation

Variable Symptom	Category	Loss consciousness Number (%)	No loss Number (%)	P-value
Paralysis	Yes	2 (33%)	1 (1%)	**0.003**
Loss of memory	Yes	3 (50%)	2 (1%)	**<0.001**

Variable Symptom	Category	Loss of memory Number (%)	No loss Number (%)	P-value
Paralysis	Yes	2 (40%)	1 (1%)	**0.002**
Breathing problems	Yes	3 (60%)	156 (96%)	**0.02**

Variable Symptom	Category	Hoarse/raspy voice Number (%)	No hoarse/raspy Number (%)	P-value
Breathing problems	Yes	145 (98%)	14 (14%)	**<0.001**

Variable Symptom	Category	Paralysis Number (%)	No paralysis Number (%)	P-value
Eyelid drooping	Yes	2 (67%)	2 (1%)	**0.001**

The analysis results indicated a number of significant associations between the various symptoms that occurred as a result of being strangled. There was found to be a positive association between each of the following: paralysis and loss of consciousness, loss of memory and loss of consciousness, loss of memory and paralysis, hoarse/raspy voice and breathing problems, and paralysis and eyelid drooping, when each of these symptoms was present the other was also more likely to be present. In addition, there was a negative

association between loss of memory and breathing problems. Breathing problems were less common when there was a loss of memory compared to when there was no loss of memory. There was no significant association between the remaining symptoms.

Fisher's exact test was used for the next analyses due to the small number of women with no swelling of the throat, and the results are summarised in Table 21 and shows the number (and %) with swelling/ no swelling of the throat for each category.

Table 21

*As*sociation between parts of body assaulted and the occurrence of swelling of the throat

Variable	Category	Swelling of throat Number (%)	No swelling of throat Number (%)	P-value
Pain in throat	Yes	142 (92%)	13 (8%)	**0.02**
Swallowing Problems	Yes No	120 (93%) 30 (79%)	9 (7%) 8 (21%)	**0.03**
Breathing problems	Yes	144 (91%)	15 (9%)	0.19

The results indicated a significant association between both pain in the throat and swallowing problems with swelling of the throat. In both cases, the presence of symptoms was associated with an increased likelihood of throat swelling. Ninety-two percent (92%) of women with a pain in the throat had swelling problems compared to only 67% with no throat pain. Also 93% of those with swallowing problems had swelling of the throat, compared to only

79% with no swallowing problems. Breathing problems were not significantly associated with the swelling of the throat.

5.5.1 The Analysis of Stroke and Strangulation as a Risk Factor

The final analysis performed to evaluate the research question related to risk and psychosocial aspect of abuse examined the association between stroke and strangulation as a risk factor. The associations for categorical variables were performed using Fisher's exact test, due to the small number of strokes. The results are summarised in Table 22.

Table 22

Association Between Stroke, and Strangulation

Variable	Category	No stroke N (%)	Stroke N (%)	P-value
Loss of conscious. (⊥)	Yes	2 (33%)	4 (4%)	**<0.001**
	No	161 (99%)	1 (1%)	
Paralysis (⊥)	Yes	1 (33%)	2 (67%)	**0.002**
	No	162 (98%)	3 (2%)	
Vomit (⊥)	Yes	7 (78%)	2 (22%)	**0.02**
	No	163 (98%)	3 (2%)	
Loss memory (⊥)	Yes	2 (40%)	3 (60%)	**<0.001**
	No	161 (99%)	2 (1%)	

(**) Median and inter-quartile range reported. Analysis using Mann-Whitney test
(⊥) Analyses for those who were strangled only

The analysis results indicated that, for those who were strangled only, there was a significant association between each of paralysis; vomiting, and loss of memory with the occurrence of a stroke. In each case those with each of the symptoms were significantly more likely to have a stroke than those without a

symptom. For example, 60% of women with loss of memory had a stroke, compared to only 1% of women with no loss of memory. A possible next stage would be to perform a multivariate analysis to examine the joint effect of these factors upon the occurrence of a stroke. However, the small number of strokes means that there is an insufficient number to do this.

5.6. Research Question Part 4: Study Comparison with Oxford Data

The analysis in this section examines the number of strokes in the dataset compared to the normal population. The study found a number of occurrences of strokes in the group. The number of strokes was compared to data from the Oxford Vascular Stroke Project register of first-ever in a lifetime stroke. This data acts as a control and indicates the number of strokes that might be expected in a 'normal' population addressing the final research question under study. The Oxford data only contained information on women aged between 20 and 44, and therefore, for comparison, only women of a similar age from this data were included for comparison. There were 28 women over the age of 44 in the data, representing 12% of the total. The observed number of strokes in each age group can be easily calculated from this data. This is compared to the expected number in the population based on the Oxford data presented in Table 23 opposite. This is calculated from the number per year from the Oxford data, and from the total time at risk of a stroke for woman in this data. The time at risk was considered to be from the age of 20 to the current age. The observed and expected numbers of strokes were compared using a chi-square test. Due to the relatively small number of strokes, all types of stroke were considered together in a single analysis.

Table 23

Matched Age and Gender Incidence Rates of First Stroke With Oxford Vascular Stroke Project Register

		OXVASC			Domestic violence study						
Age (years)	Strokes in 5 yrs	No. at risk per year	Number/ number at risk	Rate/1000 (95% CI) per year	No. in sample	Strokes in sample	Person years (from 20 years)	Rate/1000 (95% CI) per year	Expected no. of strokes	Observed/ Expected	(95% CI for O/E)
Ischaemic stroke											
20-24	0	3612	0/3612	0.00 (0.00,0.20)	19	0	47	0.00 (0.00,78.49)	0.000	--	--
25-29	0	3330	0/3330	0.00 (0.00,0.22)	49	1	347	2.88 (0.07,16.06)	0.000	--	--
30-34	0	2185	0/2185	0.00 (0.00,0.34)	63	1	772	1.30 (0.03,7.22)	0.000	--	--
35-39	2	3208	2/3208	0.12 (0.02,0.45)	53	1	885	1.13 (0.03,6.30)	0.110	9.06	(0.23,50.49)
40-44	5	3183	5/3183	0.31 (0.10,0.73)	26	0	568	0.00 (0.00,6.49)	0.178	0.00	(0.00,20.67)
Total	7	15518	7/15518	0.09 (0.04,0.19)	210	3	2619	1.15 (0.24,3.35)	0.289	10.39	(2.14,30.36)
Primary intracerebral haemorrhage and subarrachnoid haemorrhage combined											
20-24	0	3612	0/3612	0.00 (0.00,0.20)	19	0	47	0.00 (0.00,78.49)	0.000	--	--
25-29	1	3330	1/3330	0.06 (0.00,0.33)	49	0	347	0.00 (0.00,10.63)	0.021	0.00	(0.00,177.00)
30-34	0	2185	0/2185	0.00 (0.00,0.34)	63	0	772	0.00 (0.00,4.78)	0.000	--	--
35-39	0	3208	0/3208	0.00 (0.00,0.23)	53	1	885	1.13 (0.03,6.30)	0.000	--	--
40-44	3	3183	3/3183	0.19 (0.04,0.55)	26	1	568	1.76 (0.04,9.81)	0.107	9.34	(0.24,52.04)
Total	4	15518	4/15518	0.05 (0.01,0.13)	210	2	2619	0.76 (0.09,2.76)	0.128	15.64	(1.89,56.48)
Any stroke											
20-24	0	3612	0/3612	0.00 (0.00,0.20)	19	0	47	0.00 (0.00,78.49)	0.000	--	--
25-29	1	3330	1/3330	0.06 (0.00,0.33)	49	1	347	2.88 (0.07,16.06)	0.021	47.98	(1.21,267.34)
30-34	0	2185	0/2185	0.00 (0.00,0.34)	63	1	772	1.30 (0.03,7.22)	0.000	--	--
35-39	2	3208	2/3208	0.12 (0.02,0.45)	53	2	885	2.26 (0.27,8.16)	0.110	18.12	(2.19,65.47)
40-44	8	3183	8/3183	0.50 (0.22,0.99)	26	1	568	1.76 (0.04,9.81)	0.286	3.50	(0.09,19.51)
Total	11	15518	11/15518	0.14 (0.07,0.25)	210	5	2619	1.91 (0.62,4.46)	0.417	12.00	(3.90,28.00)

5.7 Factor analysis

Factor analysis (FA) with varimax rotation was performed for each of the sections of the questionnaire with exception of the GHQ-12. The goal of the FA was to reduce the large number of variables into a more manageable smaller data set of factors and reveal any latent variables that correlate highly. Factor analysis was considered suitable for use determined by the Kaiser-Meyer-Olkin (KM0) measurement of sampling adequacy. The Bartlett's test of sphericity indicated that the data was suitable to be factor analysed. This gave a p-value of <0.001, providing strong evidence that the data was suitable. Factor analysis was also performed to check the reliability of the questionnaires used in the study and compare them with the author's findings in other studies.

A factor analysis was performed to examine the variables in ***part one*** of the questionnaire the resulting scree plot is shown in the next graph. The resulting scree plot was used to determine the number of important factors to interpret. The scree plot shows no definite tailing off. However, there is a change in gradient at factor 5, suggesting that only the results from the first four factors should be interpreted.

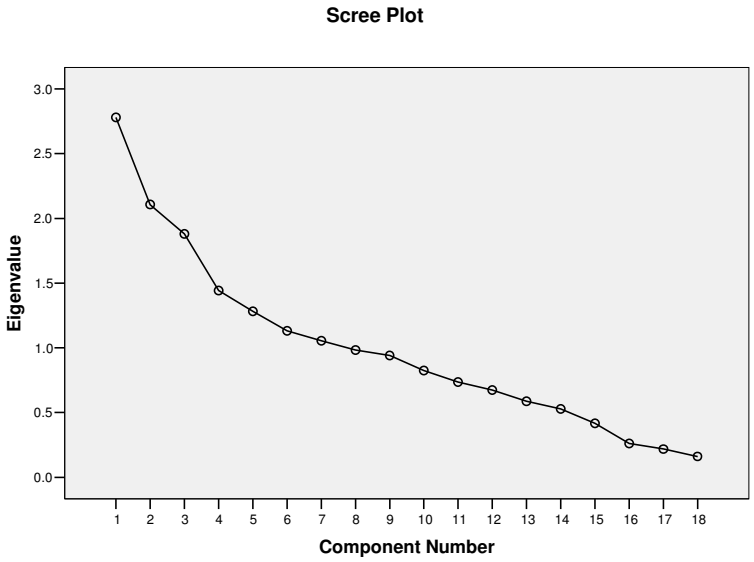

Figure: 2 Scree plot showing part one of questionnaire variables

A summary of the rotated loadings for these first four components is given in Table 24. Those variables with large loadings (over 0.5) for each component are highlighted in bold.

Table 24

Rotated Component Matrix

	Component			
	1	2	3	4
Employment status	.299	-.146	-.016	.324
Health status	**.817**	-.059	.069	.099
Last consult GP	**.794**	.050	.070	.136
How many GP visits in last year	**.895**	-.090	.009	.040
Partner accompany to GP	-.138	-.030	.104	.036
exercise	.268	-.107	.030	-.030
smoke	.094	-.018	-.027	.433
alcohol	-.240	.035	.220	.385
contraception	-.120	.060	.029	**.713**

Table 24 (continued). *Rotated Component Matrix*

	Component			
	1	2	3	4
Eat healthy	-.087	**.913**	-.005	-.072
breakfast	-.091	**.572**	.079	.238
lunch	-.022	**.778**	.037	-.089
evening	-.051	**.716**	-.109	-.106
High blood pressure	-.012	.064	.045	**-.587**
Family history BP	-.054	.005	.380	-.382
medicine	.108	.029	**.912**	-.057
violence	.048	.007	-.069	.175
% Variance explained	**15%**	**12%**	**10%**	**8%**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

The four factors accounted for 45% of the total variance emerged from this analysis. Factor 1 explained 15% of the total variance consisted primarily of health status and GP consultations. Factor 2 loadings explained 12% of the variance and appear to be connected to eating healthily. Factor 3 explained 10% of the total variance and is best conceptualised as the use of prescription drugs and taking medicines. Whereas Factor 4 although it explains 8% of the variance it reflects contraception negatively associated with High Blood Pressure. It should be noted when interpreting these loadings that all eigenvalues were relatively small, with no component explaining more than 15% of the total variability in the data. This suggests there may be little in the way of strong associations between variables in the data. The Cronbach alpha reliability was 0.72 compared with the original authors Cronbach of 0.88, the lower Cronbach alpha may be due to the fact that many more questions were used in this study, however, this is a reasonably high concordance with the original.

A factor analysis was performed with a Varimax rotation for the ***second part*** of the questionnaire, and the resulting scree plot is shown in the next graph.

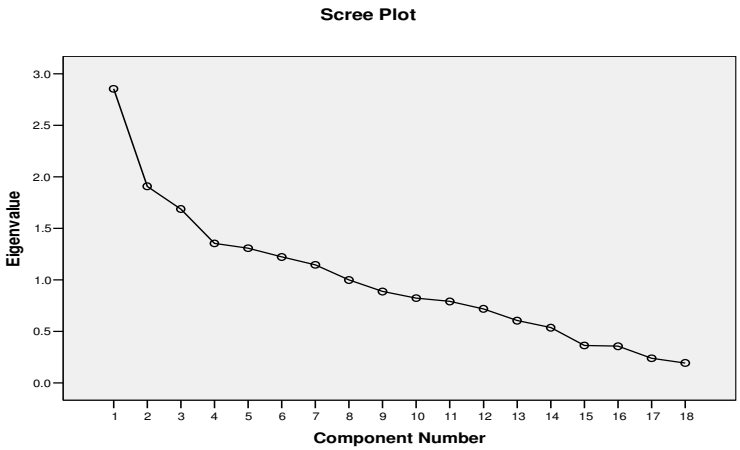

Figure: 3 Scree plot showing part two of questionnaire variables

There is a change in gradient at factor 4, suggesting that only the results from the first 4 factors should be interpreted. A summary of the rotated loadings for these first three components is given in Table 25. Those variables with large loadings (over 0.5) for each component are highlighted in bold.

Table 25

Rotated Component Matrix

	Component			
	1	2	3	4
Migraine	**.785**	.228	-.104	.030
Migraine family	**.673**	-.071	.226	.214
Disturbed vision	**.724**	.304	-.069	-.082
Disturbed Vision family	**.693**	-.087	.104	.234
asthma	-.155	**.531**	-.387	.349
Asthma family	.102	**.808**	.050	.077
Eczema/psoriasis	-.112	.220	.435	.243
Eczema/psoriasis family	.139	.435	.465	.221
allergies	.137	**.611**	-.015	-.219
Clinical depression	.014	.140	.177	.429
Headache/blackout	.230	-.117	.026	**.601**
Neurological disorder	.051	.475	.102	.009
Stiff neck/tension	.032	-.217	-.134	-.072
Eating disorder	.078	.117	**.581**	.128
Back joint muscular	.394	-.117	**-.538**	.008
Sleep problems	.115	.021	.069	.311
Bowel disorder	.188	-.134	**.667**	-.124
cardiovascular	-.052	.025	-.092	**.684**
% Variance explained	**16%**	**11%**	**9%**	**8%**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 8 iterations.

The results suggested that the first component, which explained 16% of the variance, consisted primarily of migraine frequency, family history of migraines, frequency of disturbed vision and family and appeared to represent migraine status. As all loadings had the same sign, this suggested a positive association between all measures. As might be expected a family history was associated with higher frequency for both migraines and disturbed vision. There was also a positive association between disturbed vision and migraines.

The key variables in the second component which would be suitably labelled allergies, explained 11% of the variance, were frequency of asthma, family history of asthma. The third component, which appeared to represent stress related illness, explained 9% of the total variance, consisted of eating disorders, back joint musculoskeletal and bowel disorder. There was a positive association between eating disorders and bowel disorders. However, both of these two factors were negatively associated with back joint musculoskeletal. This suggests that back joint musculoskeletal was less common in women with eating disorders and bowel disorders. The fourth component seems to represent somatic symptoms and accounts for 8% of the variance explained and suggests a positive association with cardiovascular illness and headache/blackouts. It should be noted when interpreting these loadings that all eigenvalues were relatively small, with no component explaining more than 16% of the total variability in the data. This suggests that there is little associations between the variables. The Cronbach alpha reliability was 0.69 compared with the original authors Cronbach of 0.73, the lower Cronbach alpha may be due to the fact that many more questions were used in this study, however, this is a reasonably high concordance with the original.

Further factor analyses examined associations of risk factors across variables in the data using oblim rotation. The variables included: alcohol consumption, smoking, illegal drugs, contraception, self-reported health status, has violence affected health, stroke, sleep problems and clinical

depression. Theoretically a factor analyses should be used with truly continuous variables, due to the assumptions behind the approach. Of the variables in this analysis a large proportion of these are either binary variables (e.g. occurrence of stroke) or ordinal variables (e.g. health status). Therefore, performing a factor analysis on this data leads to violations of the assumptions of the method. Therefore, the results obtained should be viewed with some caution. The scree plot can be seen below in Figure 4.

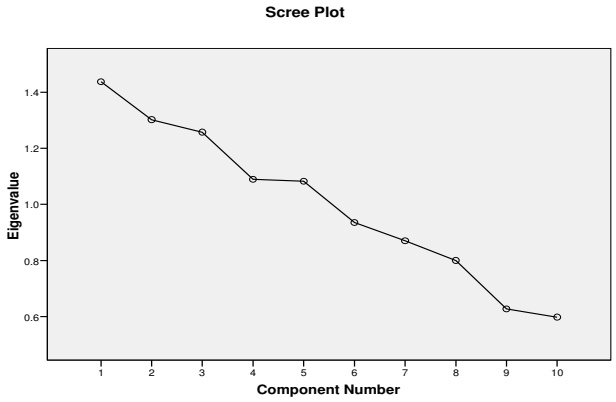

Figure: 4 Scree plot showing stroke and other risk factors

The results indicate a fairly constant slope for the scree plot, with all eigenvalues being fairly small in size, the largest being only 1.4. This suggests that there is little in the way of any strong associations between the variables in the analysis. There is a slight levelling off of the slope at component 4, so it was chosen to interpret the first three factors. A summary of the rotated loadings for these first three components is given in Table 26. Those variables with large loadings (over 0.5) for each component are highlighted in bold.

Table 26

Oblim Rotated Loadings

Questionnaire items	Component 1	Component 2	Component 3
10. Alcohol	-0.13	**0.79**	-0.26
9. Smoking	0.24	0.00	**0.70**
12. Illegal drugs	0.34	0.04	**-0.77**
11. Contraception	0.18	**0.68**	0.30
4. Health status	0.09	0.02	0.00
17. Violence affects health	**0.62**	-0.11	-0.11
27. Stroke	**0.79**	0.11	0.05
30. Sleep problems	0.01	-0.08	-0.01
25. Clinical depression	0.12	-0.23	0.01

The results suggested that the first component consisted primarily of violence affecting health and stroke, with a positive association between those two variables. The key variables in the second component were alcohol and contraception, with a positive association between the two variables. The third component consisted of smoking and illegal drugs, with the results indicating a negative association between these two variables, due to the differing signs of the loadings (one positive, one negative). However, it should be noted when interpreting these loadings that all eigenvalues were small, suggesting little in the way of strong associations between variables.

From an examination of the scree slope there appeared to be 4 factors explaining the majority of the variance. The resulting scree plot is shown in the graph opposite.

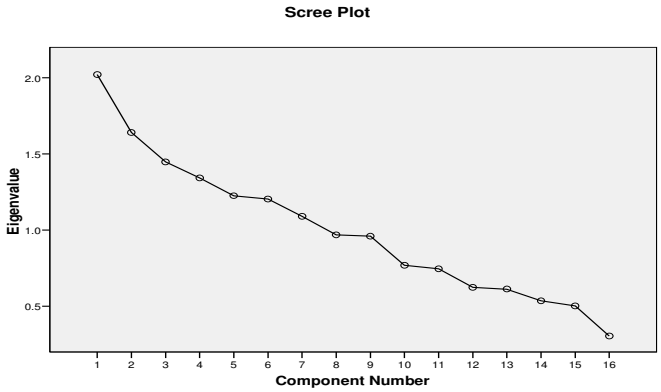

Figure: 5 Scree plot showing association of strangulation and risk factors

A four-factor solution was selected accounting for 40.3% of the total variance. A summary of the rotated loadings are given in the next table. Those variables with large loadings (close to 0.5 or above) for each component are highlighted in bold. The percentage of the total variance explained by each component is also reported in Table 27 below.

Table 27

Summary of Oblim Rotation Loadings

Questionnaire items	Component 1	Component 2	Component 3	Component 4
4. Health Status	**.87**	.08	-.04	.08
14. High blood pressure	.04	**.66**	.10	.21
17. Violence affected health	.01	.07	.10	**-.83**
25. Clinical Depression	.29	-.05	**.71**	-.10

Table 27 (*continued*). *Summary of Oblim Rotation Loadings*

Questionnaire items	Component 1	Component 2	Component 3	Component 4
29. Eating disorder	-.22	-.02	**.70**	-.05
28. Stiff neck	.24	**-.51**	.06	.37
30. Strangled	-.12	**-.70**	.06	.18
6. Times consulted GP	**.86**	.01	.02	-.05
% variance explained	13%	10%	9%	8%

The results suggest that there are no clear associations between the variables in the data that explain any large proportion of the variability in the data but measure some related constructs. The first component explains only 13% of the variability within these factors. The questions that loaded onto component one consisted primarily of health status and times consulted GP. Both variables had a positive sign, suggesting that the two measures were positively correlated with each other and relate to negative health outcomes of victimisation.

The questions that loaded onto component two consisted primary of high blood pressure, stiff neck and strangled. Stiff neck and strangled had the same direction of loading, suggesting that these were positively correlated with each. However, high blood pressure was negatively associated with both a stiff neck and strangled all seem to account for high-risk lifestyle. The third component consisted primarily of depression and eating disorders with the results indicating that these two measures were positively correlated with each other and seems to account for psychological morbidity and

development of eating disorders. The fourth component was not straightforward to interpret mainly consisting of violence affecting health.

5.8 General Health Questionnaire Analysis

The purpose of the analysis was to identify the possible presence and severity of the level of psychological distress within the sample. Initially summaries of all variables in the data were produced. The GHQ-12 responses were analysed using likert scoring to assess the severity of psychological distress measured on a continuous scale. The likert scoring results presented in Table 28 below indicated that 65% of the sample despite taking anti-depressant medication were experiencing high levels of distress compared to 10% found in the 'normal' population in Britain (ONS, 2001).

Table 28

Summary of the 12-item GHQ Responses

Variable	Category	GHQ score	Number (%)	Severity (%)
GHQ (Likert)	Low	0-10	34 (18%)	35%
	Typical	11-12	33 (17%)	
	More typical	13-15	26 (14%)	65%
	Distress	16-20	31 (16%)	
	Severe distress	21+	68 (35%)	

Further analyses were performed using a regression approach, with the particular regression method dependent on the nature of the outcome variable. Each set of analyses was performed in two stages. Initially the individual effect of each explanatory variable upon each outcome was examined separately in a series of univariate analyses. Subsequently the

joint effect of the explanatory factors upon the outcome was examined together in a multivariate analysis. An advantage of the multivariate analysis is that the effect of each variable upon the outcome is adjusted for the effect of the other explanatory variables, and so should give a better view of the underlying factors influencing the outcome.

The first two groups of analyses used the occurrence of a stroke as the outcome, and therefore the analysis was performed using logistic regression. The exception to this method of analysis was for explanatory variables where all the subjects in one category took the same outcome (e.g. all subjects within a group did not have a stroke). In such a situation it is not possible to calculate the odds ratios, and so not possible to perform logistic regression. In these situations the analysis was performed using Fisher's exact test. It was not possible to perform a multivariate analysis for these variables. The two outcomes were violence influencing health and depression, both of which were measured on 4-point ordinal scales. The violence measure ranged from 'not at all' to 'yes very', whilst the depression variable ranged from never suffered to severe. Due to the nature of these outcomes, the analysis was performed using ordered logistic regression. All the variables tested were not found to have a statistically significant effect.

The concluding correlation involved evaluations between each individual variable and GHQ scores examined. The results of the pearson correlations are summarised in the final table below.

Table 29

Associations between Proportions of women Strangled Alcohol use and levels of Distress Experienced Among Sample

Variable	Anxiety		Depression	
	Coefficient	P-value	Coefficient	P-value
10. Units of alcohol / day	0.18	**0.02**	0.19	**0.01**
45. Strangled	0.19	**0.01**	0.08	0.25

The most notable correlations included significantly positive associations between GHQ variables and the number of units of alcohol per day. A greater number of units of alcohol were associated with increased GHQ scores, although the actual correlations were fairly small, less than 0.20. There was also a significant positive association between strangled and anxiety, indicating that those women that were strangled not surprisingly had higher anxiety scores. Again, the actual correlation was fairly small, around r = 0.2.

CHAPTER VI: DISCUSSION

6.1 Introduction

This concluding chapter provides a discussion of the results and some implications of these. The chapter refers to the literature findings and the role of predisposing psychosocial factors in stroke and compares the current findings. The chapter also discusses the practical applications of this research and recommendations for future research are suggested.

6.2 Discussion

The study found a higher than expected incidence of first stroke among a sample of 237 young women exposed to domestic abuse, this has not been reported previously. Five cases of stroke in women aged 25 to 40 years (mean, 31.4 years) were identified these included three ischemic and two hemorrhagic strokes. The finding for ischemic stroke indicated a 10-fold higher risk and more than 15-fold higher risk for hemorrhagic stroke. The crude age-specific incidence rate of first stroke were significantly higher than those reported in the UK Oxford stroke register (0.14/1000 per year). The results confirmed a strong association with psychosocial risk factors which indicate trauma to be the most common predisposing factor to stroke; this is consistent with ongoing marked life difficulties of living within an abuse relationship.

Factors - which increase the risk of stroke in younger women were health damaging behaviours including smoking and oral contraception, heavy

alcohol consumption; these findings are consistent with those found by Chang et al., (1999) and Hillbom et al., (1995). No associations were found related to hypertension as a risk factor for stroke in this study unlike those found by Adam et al., (1986); Bogousslavsky, (1992); Tuomilehto, et al., (1991) and others.

Other reported risk factors in this study in younger women included the presence of other co-existing medical conditions which is supported by literature on life events and physical illness by Creed (1985); Henry (1986); Murphy and Brown (1980). The role of psychological factors in the cycle of stress confirmed a strong association with a lack of adaptive personal and social resources to stress resistance which could explain the increased prevalence of medical and psychiatric disorders found in this study. This would serve to suggest that the women in this study maybe more inclined to be using avoidance-coping strategies and at increased risk for depressive disorders, self-harm and suicide as found by Modcrin-McCarthy and Tollett (1993). The findings here are consistent with literature on life events, physical illness and psychiatric disturbance as discussed by Brown and Harris (1978, 1989); Holmes and Masuda (1974); Murphy and Brown (1980) and others. A considerable proportion of the study (65%) reported suffering severe psychological distress measured by the GHQ-12 indicating a strong relationship with exposure to severity of trauma. This self-reported psychological distress was six times higher than that found in the general population. The most striking difference was that over a third of the women

were currently taking anti-depressant medicine. It might be argued that the findings of mental illness must be viewed with caution, perhaps a more plausible explanation for the mental illness incidence observed in this study is that the symptoms may be in reality those associated with post-traumatic stress disorder as a consequence of chronic exposure to threat. No significant association was found related to other commonly recognised risk factors of stroke; hypertension, family history, physical inactivity and diabetes mellitus unlike those found by Kim et al., (2004); Touze and Rothwell (2007) on family history and You et al., (1997) on diabetes and hypertension risk factors. However, this study showed that the women in this study were at increased risk for suffering physical illnesses in the context of a family history for disease such as: migraine, asthma, bowel disorder, diabetes, psoriasis, depression, cardiovascular disease. Studies on stroke risk factors among young women found the effect of physical inactivity less well-documented.

In this present study the majority of women (92%) reported that exposure to domestic violence had a marked adverse affect on their overall health. Over half of the study was explicit about the extent to which their physical health and mental state had significantly deteriorated as a result of exposure to long-term disturbing events of a threatening nature (Golding, 1999; Grant et al., 1989; Hilton-Jones & Warlow, 1985). To a greater extent psychological factors were reported with increased frequency, specifically, negative emotions, onset of depression, stiff neck tension, eating and bowel disorders and somatic complaints such as gastrointestinal abdominal pain and

musculoskeletal disorders as a consequence of emotional disturbance related to exposure of domestic violence; these findings are congruent with studies by Campbell (2002); Emerson and Harrsion (1990); Higgins and Endler (1995); Mitchell and Hodson (1983); Plichta (2004) and Wills (1990). The results provide support for the view that serious health consequences experienced by the women within the study are strongly associated with stress supported in literature by Brown and Harris (1989); Lazarus (1990) and Steptoe (1991). This study suggests that exposure to psychologically threatening situations in a predisposed women may act as a precipitant to weakening the immune system creating increased susceptibility to disease risk which is consistent with research by Cohen and Herbert (1996); Craig and Brown (1984); Creed (1985); Henry (1986); Higgins and Endler (1995); McEwen (1998) and Steptoe (1991).

The appraisal of the overwhelming stress effect on the women in this study suggested that the majority of the study were found to have a stroke risk profile. The results indicated that a high proportion of the women were engaged in poor health behaviours, perhaps to combat and alleviate pressures of living in an abusive relationship. This is congruent with other studies linked to negative health behaviours as a form of coping with stressful life events documented by a number of researchers (Campbell, 1995; Pearlin & Schooler, 1978; Tjaden & Thoennes, 2000). The majority of the women in this study were classified as current heavy smokers (mean, 18 cigarettes per day) and consumed in excess of three units of alcohol daily. Findings for

smoking and alcohol use were higher than those found in the general population (ONS 2006). Other risk factors indicated that 30% of the women using oral contraception also smoked. Sixty-percent of women in the study also reported suffering migraine another associated stroke risk factor. The literature on alcohol consumption in younger women and increased risk of stroke appears ambiguous however, it finds support in the study by Happaniemi et al., (1997).

Sixteen per cent of women reported using illegal drugs (eg.,heroine/crack, cocaine, cannabis) daily which further highlights additional sources of stress by engaging in risk taking behaviour (Haapaniemi, Hillbom & Juvela, 1997; Hillbom, Haapaneiemi, Juvela, Palomaki, Numminen, & Kasta, 1995; Windle & Windle,1996). Furthermore whilst under the influence of drugs abused women are at increased risk for sexual assault, severe injuries and homicide as evidenced in the domestic violence literature by Campbell, et al., (2007); Glass et al., (2008) and further supported by literature from Wills (1990) study on use of drugs as a coping mechanism for stress.

In this study unemployment status and inability to work were found to be attributable to ill health. Such findings are supported by previous research studies explaining the effects of domestic violence on employment status. Most of the work stress can be explained by strained relationships with employers as a result of frequent absenteeism and reduced physical functioning and disturbed sleep patterns related to psychological strains

(Johnson & Gardner, 2000). This effect is further evidenced by research studies which found women from abused relationships spend more days confined to bed than non-abused women (Heise & Garcia-Moreno, 2002; Plichta, 1992,2001,2004).

Given the multitude of chronic health conditions and the severity of symptoms reported within this study which is parallel to previous research findings by Campbell (2002); Coker et al., (2000). A high proportion (71%) of the women in this study rated their perceived general health status to be poor with over half of the women been physically inactive and rarely taking exercise. The majority of the study reported increased use of primary health care resources. This pattern of repeated contact with health professionals is compatible with previous research findings by Sutherland, Bybee and Sullivan (2002). The evidence provides support for the view that abused women receive more treatment in primary care either in hospital or by use of prescribed drugs for physical injuries and mental heath conditions than those of non-domestic abused women. These findings are supported by Campbell's (2002) research. Evidence that abused women visit their GPs three times more often than non-abused women, irrespective of how they self-assess their health status was found, this is similar to Campbell (2002); McWilliams and McKiernan (1993); Wisner et al., (1999) findings.

Interestingly this study found that primary health care services are responding appropriately to screening for domestic violence. The majority

(80%) of women in routine contact with doctors, accident and emergency departments, reported being screened for domestic violence. This response by medical practitioners demonstrates a major development in the achievement of the recommendations set out by the Department of Health (2000) and further demonstrates positive progression from earlier research findings by Waalen (2000) and Walthen (2003). All of these studies reported a lack and resistance to screening by health care professionals.

The detection of victims of domestic violence in health care settings found (40%) of the study sample disclosed domestic violence. This finding evidently challenges Ramsay et al., (2002) theory on screening for abuse being a waste of time. However, in contrast (27%) of the women reported that accident and emergency departments failed to provide referral information. The results showed that there was no association between whether the health professional asked how the injury was caused and whether the women disclosed the injury cause. Importantly, there was a significant association between being asked about the cause of injury and whether contact details for seeking help were provided. When women were asked about cause of injury, they were more likely to be provided with contact details about help. Forty-seven percent (47%) of women were given contact details in the group asked how the injury was caused, but the equivalent figure was only 19% in the group not asked about injuries. This is consistent with the findings of Wathen et al., (2003) and Wilbur et al., (2001).

The women in this study reported been exposed to high levels of trauma generally as a result of violent assault to the body. The majority of women in this study reported experiencing head and facial injuries which is similar to that found by a number of researchers (Auer et al., 1994; Began et al., 1990; Carrigan, 2000; Hindfelt & Nilsson, 1977; Jackson et al., 2002; Monahan & O' Leary, 1999). In this study 97% of women reported been manually strangled by their partner by use of two hands, in some cases, in excess of five episodes. Strangulation was found to be the most common mechanism used in violent assaults with disturbing outcome resulting in paralysis and eyelid drooping, loss of vision, consciousness, memory problems, severe head and neck pain, difficulties in swallowing and breathing. The potential for significant medical complications as a result of strangulation is supported by the studies of Campbell, et al., (2007); Funk and Schuppel (2003);Glass et al., (2007) and Strack et al., (2001).

The strangulation symptoms found bear a strong resemblance to conventionally recognised signs and symptoms of stroke. Furthermore, highlight the importance of addressing early treatment and appropriate diagnosis of strangulation injury compared to that of stroke. In particular that all women presenting for health care with stroke-related symptoms be asked the question as a diagnostic measure "*have you been strangled*" in order to minimise the debilitating effects of stroke.

In examination of the profile of the five women suffering stroke in this study found all reported smoking for fifteen years and more. Three of the women reported to be heavy drinkers with one woman consuming three times in excess of the weekly-recommended limit of 14 units (ONS, 2006). The same three women reported use of oral contraceptive pill and two women reported using illegal drugs daily. Three of the women reported suffering migraines of which two also take the contraceptive pill. All five women were found to have been in an escalating domestic violence relationship for 8 to 10 years and that violence had a pronounced effect on their health. None of the five women were found to have hypertension or diabetes. All five women recorded having experienced physical, psychological, emotional, and financial abuse. Furthermore, four of the women reported experiencing sexual abuse during the relationship (Coid et al., 2001). All five women reported health complaints, which included disturbed vision, headache, blackouts, stiff neck tension, and clinical depression. This study found that all five women had been strangled and reported been shaken violently, experiencing breathing problems, swelling and pain to the throat, dizziness, neck pain, and a hoarse and raspy voice. Three reported loss of consciousness, paralysis and loss of memory as a result of being strangled and one reported eyelid drooping all of the symptoms here are supported by research suggesting these effects result in stroke (Malek et al., 1999,2000; Milligan & Anderson, 1980; Purvin, 1997).

The results indicated that, for those who were strangled, there was a significant association between each of paralysis, vomit, and loss of memory with the occurrence of a stroke. All five women recorded having attended for medical care, following head and neck injuries. Four women disclosed domestic violence of which three were asked and two provided with referral information relating to support agencies. Other serious injuries reported by the five women included been violently slapped, punched, kicked, and knifed, burned with a cigarette and hot liquid. Other injuries experienced involved being head-butted, having their head stood on and hit with a hammer.

In the interpretation of the findings in this study it would serve to suggest that women exposed to domestic violence seem to be at increased risk for morbidity and mortality as a consequence of environmental and lifestyle factors. In conclusion this study suggests that exposure to living in overwhelming threat as a result of domestic violence may predispose certain individuals to increased risk of early stroke. The incidence of stroke presented in this study may be an underestimate as a consequence of women not attending for treatment thus managing stroke symptoms at home. Thus accelerating awareness and prevention of stroke within society is crucial in reducing risk of first stroke.

6.2.1 Study Limitations

There are a number of potential shortcomings which should be taken into account when interpreting the results from this study. The level of knowledge

of stroke in the general population is lacking. Indeed there is a general misconception held by lay public that both stroke and heart attack are the same condition. Due to the lack of public knowledge and general level of awareness regarding stroke, the author attempted to substitute this deficit of understanding of stroke in simplifying and defining the medical terms used within the survey instrument. Concerted efforts were made entirely to differentiate heart attack and stroke conditions. The survey provided several definitions of medical terms explaining the two types of stroke that can be found (ischemic and hemorrhagic) and the differentiation between choking and strangulation. Another possible explanation for shortcomings of this study may be the way in which the self-report survey questions were asked and interpreted by the respondents. In retrospect, the survey instrument questions should have been written in plain and simple language; asking the question; “have you ever had a stroke” followed up by a question to determine the age at which the stroke occurred, this would have made the analysis less speculative.

In addition, future studies will attempt to measure strain as early as possible after the victim has left the violence relationship. Thus rendering a more suitable approach to measuring distress as the GHQ only captures victims at a certain point in time and fails to ascertain how long the changes have persisted. The timing from onset of symptoms to treatment would also have been important data in measuring timely access to emergency medical care. Other weaknesses of the study include those typical of self-report surveys

(e.g., subject to recall bias). There are no available comparable studies. Most stroke risk factors can be controlled or modified. However, the incidence of stroke found in this study population of young women is testimony of a stroke risk factor that exists, which is not easily modifiable. The complications in this study have been in teasing out how much stroke risk is related to the domestic violence and how much is associated to high-risk health related behaviour and stress. Findings for the effect of educational status (low level education) must be interpreted with caution. Thus, it is probable that the true prevalence of stroke among our sample may be even higher than we report here. All of these considerations mean that several counterbalancing biases may have influenced the final data.

CHAPTER VII: CONCLUSION

7.1 Introduction

There are a number of reservations of the current analyses, which should be taken into account when interpreting the results. Firstly, the Oxford community stroke data only contained information on women aged between 20 and 44, and therefore for comparison, only women of a similar age from this data were included for comparison. There were 28 women over the age of 44 in the data, representing 12% of the total. The stroke analysis omitted women aged 45 and over. In this age group there were no observed strokes in the current data. However, there would be expected to be some strokes in the normal population. Therefore, there were actually less than might be expected for this age group. However, as the normal population data was not available, this age group cannot be included in the analysis. Another reservation might be that this group and the Oxford Group may not be comparable in terms of other risk factors for strokes. This group of women may be more at risk of strokes than the Oxford stroke project group, even if they were not in domestic violence relationships. Without characteristics of the two groups, it might not be possible to address this point. Future research would need to control for this shortcoming.

7.2 *Conclusion*

This UK study was conducted and developed by the authors previous research to determine the incidence and examine the predisposing risk factors for early stroke in young women suffering domestic violence and

raised important issues. The research process involved rigorous examination of the literature on causal pathways to disease with a specific focus on the role of stress and disease risk linking relationships between domestic violence, adverse health outcomes and the degree to which victims are at higher risk of experiencing a stroke. Consequently, this study identified key findings of incidence of stroke in that five young women of reproductive age (mean age, 31 years) reported first-time stroke. The findings of first-stroke are unlikely to be attributable to chance. According to the UK Oxford Stroke register this is distinctly younger than that found in the general population. This study's findings are consistent with the outcome of exposure to domestic violence and abuse, which may be an important contributory risk factor of stroke. Stroke in young women is rare and this study extends the literature base and raised important issues that clearly warrant further investigation. Based on the findings here this study emphasises the importance of continued efforts to increase awareness of risk factors of stroke.

7.3 *Recommendations*

Recommendations for future research directions are presented:

- Screening protocols for stroke to consider domestic violence as a risk factor.
- To identify partner violence through effective screening.
- Improved best practice in health care settings to improve patient outcome in addressing suspicious high-risk injuries (i.e. strangulation).
- Improved documentation of medical course of events following violent assault for prosecution purpose.

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APPENDICES

Appendix 1: Ethical Management of Study

ETHICAL CONSIDERATIONS

Permission for Approval of Study

The first field committee panel meeting involved a professional critical review of the research study design and its methodological reliability to determine whether the study was of a suitable, level 12-doctorate standard. The research project was assessed on the basis of innovative quality, and how the proposed research project would essentially build upon existing research knowledge and offer the opportunity to inform practice.

The field committee were of the opinion that although the study met the criteria for doctoral research, it was ambitious for the timescale, as the research also required the development and design of a questionnaire as no existing instruments were found to be suitable. The committee enquired whether National Health Service approval was required for the cross-match data provided by the Oxford Community Stroke Project. Professor Rothwell clarified that no further NHS ethics approval was needed as the Oxford community stroke project already had an existing broad ethical approval. Following feedback and subsequent modifications the field committee granted permission to pursue an application for ethical approval.

Informed Consent

The cover letter, which accompanied the self-completion questionnaire booklet, incorporated consent procedures and data protection information.

The principle of respect for the individuals in this research incorporated the need to protect this vulnerable population. This had been addressed by the procedures of gaining individual informed consent to ensure that the participants were informed and understood the purpose of the research, risks and benefits, anonymity and moreover, that their participation was voluntary.

During the consent procedures a full explanation of the study was provided to participants by trained refuge staff. This research was framed as a study on 'women's health'. The exact nature of the study was explained fully prior to completion of the questionnaire, explaining that questions would be asked about experiences of violence. Permission to proceed was controlled by allowing the participant adequate time to make decisions to withdraw before commencing completion of the questionnaire. This measure provided the opportunity for an individual to withdraw their participation, without giving a reason, and choice not to answer any questions that were of a distressing nature. Consideration for participants recalling traumatic events of a sensitive nature were controlled by providing contact details of 24 hour support agencies including the National Domestic Violence helpline. The researcher provided a helpline contact together with the research supervisor contact details.

Appendix 2: Search Engines

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

A wide variety of available free of charge databases were electronically selected over the internet including trial registries, web catalogues (e.g., dissertations, abstracts). Full text and specialised bibliographic databases; Medline and other major databases Embase and Cinahl were searched from the start of the databases to February 2008 using a combination of medical subject headings (using wildcards when necessary, filters, text words and truncation. Specific key terms were combined using boolean operators for database searching. Citations, abstracts, books, reports and grey literature were located. Other databases searches included psychinfo, and the Cochrane database of systematic reviews. Use of the internet located researchers to facilitate personal communication who were then contacted by email, letter or telephone for requests for contribution of information relating to unpublished or in press studies. Key journals were hand searched and indexing of databases utilised, based on citation frequency. Reference lists that met inclusion criteria were scanned to locate additional studies. Sage Journals online were searched independently as the main publisher of journals relating to domestic violence. Databases utilising silver platter search platforms allowed sensitive and specific searches to be performed e.g., ScienceDirect, OvidSP, EBSCO, ProQuest, JSTOR and PubMed. Search terms used for the review were as follows;

1. Domestic Violence/

2.domesticviolence.mp. [mp=title,abstract, cas registry/ec number word, mesh subject heading]

3. Spouse Abuse/

4. Intimate Partner violence/

5. IPV/

6. Battered women.mp.

[mp=title,abstract, cas registry/ec number word, mesh subject heading]

7. domestic adj violence and strangulation[mp=title,abstract, cas registry/ec number word, mesh subject heading]

8. spouse adj abuse and strangulation. mp. [mp=title,abstract, cas registry/ec number word, mesh subject heading]

9. domestic adj abuse and strangulation

[mp=title,abstract, cas registry/ec number word, mesh subject heading]

10. Family violence/

11. Family abuse/

12. Familiar violence/abuse/

13. Homicide and strangulation/

14. Femicide and strangulation/

15. Trauma and strangulation/

16. Violence and strangulation/

17. partner adj abuse and strangulation/

18. death by strangulation/

19. fatal adj strangulation/

20. strangulation and choking and throttling/.

21. Manual strangulation/ [mp=title,abstract, cas registry/ec number word, mesh subject heading]

22. strangulation adj. abuse and violence

23. wife adj abuse and violence/

24. wife adj strangulation/

25. home adj strangulation and abuse [mp=title,abstract, cas registry/ec number word, mesh subject heading]

26. home adj violence and murder [mp=title,abstract, cas registry/ec number word, mesh subject heading]

26. Domestic$

27. Violence$

28. IPV$

29. Strangulation$

30. spousal abuse$

31. #domestic violence

31. #mass screening

32. #partner abuse

33.#spouse abuse

34.#wounds and injuries

35.screen$.tw.

36.screening$

37.screening and detection/

38.detection

39.emergency department/

40.emergency service/

41 #crisis intervention

42 #health planning support

43#professional-patient relations

43#physician-patient relations

44#screening and intervention/

45#mass screening

46#screening and referral/

47#medical history taking/

48#mandatory reporting and confidentiality

49family stress$

50#stressful life experiences/[mp=title,abstract, cas registry/ec number word, mesh subject heading]

51Major life stress events$

52posttraumatic stress disorder/

53traumatic stress/

54stress and physical injury/

55stress and traumatic events$

56victims of traumatic events/

57stress and stroke$[mp=title,abstract, cas registry/ec number word, mesh subject heading]

58stroke in young women/

59stroke risk factors$

60stroke risk in young women$[mp=title,abstract, cas registry/ec number word, mesh subject heading]

61stroke and carotid artery/

62stroke in young adults/[mp=title,abstract, cas registry/ec number word, mesh subject heading]

63blunt neck trauma/

64carotid artery and young women$

65cerebral Infarction young adults/

66traumatic carotid artery dissection/

67ischemic stroke in young women

68stroke prevention/

Appendix 3: Introductory Letter/Email

To whom it may concern

Long term health effects of abuse

My name is Yvonne Smith and I am writing to seek your support for a national research study. I am a Trainee Professional Health Psychologist at Queen Margaret University, Edinburgh. My aim is to investigate the long term health effects of Domestic Violence and explore the dominant risk factors. This research already has full ethical approval from the University research panel. I have acquired your contact details from the Women's Aid gold book directory.

This Doctorate research study has been developed from specific findings in a previous research study conducted in West Yorkshire, England which identified potential long term health risks as a result of domestic violence. The impact of domestic violence identifies many unresolved questions of the longer term health effects in particular, for victims who have been subjected to extreme levels of violence. I am well informed of the issues around postal questionnaires and of the ethical considerations in safeguarding participants. Strict confidentiality and participant anonymity is guaranteed.

I would be delighted if you could support recruitment of participants for this research study. I am seeking to recruit women aged 18-56 living at home or in temporary refuge living accommodation. If possible, I would appreciate any help in distribution of the survey packs to your clients. The survey pack consists of the questionnaire, a cover/consent letter, and a pre-paid envelope addressed to the researcher. The questionnaire is 7-8 pages in length. The participants are asked to complete the confidential self-report questionnaire and return it by pre-paid post to the researcher. All postal costs will be funded and I ensure that no costs will be incurred by any of the participating organisations. I appreciate any support and welcome comments from any of the women's aid organisations. I would be more than happy to answer any queries you may have relating to this research study. If you feel you are able to help, I can be contacted by return e-mail or on the following number Mobile: 07772018376.

I thank you for your time in reading this long e-mail and hope I can count on your kind support. For any confirmation of the legitimacy of this study please contact the secretary Ms A. Tulloch at Queen Margaret University (Psychology), Edinburgh (0131 317 3769) where you can be put through to my supervisor Dr. Joyce Willock.

Full acknowledgement of all participating organisations will be recorded in the published findings.

Kind regards

Yvonne Smith
Professional Chartered Doctorate Health Psychologist in training

Centre of Health Psychology
School of Social Sciences, Media & Communication
Queen Margaret University
36 Clerwood Terrace,
Edinburgh, EH12 8TS
Scotland

Appendix 4: Questionnaire Booklet

/07

Strictly Confidential

The implications of Domestic Violence against women resulting in injury and long term health effects

This Survey will produce findings on the impact of domestic violence on women's health

The implications of Domestic Violence against women resulting in injury and long term health effects

This questionnaire has been designed to obtain information about experiences of domestic abuse. Responses to this survey will contribute to understanding the effects of domestic violence on health and to discover what improvements can be made to current practice in support of effective interventions in health settings. Please answer all of the questions as fully as possible.

Part One - Health Status Assessment Questionnaire

1.About you

Year of Birth e.g. 1961 ……

First part of your postcode e.g., BD21 ……...

Relationship status (*Please circle*)

Single Married Divorced Separated Widowed Living with partner

What is your height? i.e. 5'4'' or 163 cm ……

What is your weight? i.e. 9st 5lbs or 59Kgs ……

2.Ethnic Group (*Self Defined*)

How would you describe yourself? (Tick appropriate box)

White	**UK**	☐	**Irish**	☐	**Other**	☐
Black	**Caribbean**	☐	**African**	☐	**UK**	☐
	Somali	☐	**Other**	☐		
Asian	**Pakistani**	☐	**Indian**	☐	**Bangladeshi**	☐
	Turkish	☐	**Greek**	☐	**Chinese**	☐
	Turkish Cypriot	☐	**Greek Cypriot**	☐	**Asian other**	☐

Other Please specify _____

3.Employment Status (*Please tick as appropriate*)

☐ **Full time employment/study** ☐ **Part time employment**

☐ **Unemployed** ☐ **Retired**

☐ **Unable to work/ill Health**

4.Health status

What best describes your health generally? (*Please tick as appropriate*)

- ☐ **Excellent**
- ☐ **Good**
- ☐ **Fair**
- ☐ **Poor**
- ☐ **Very Bad**

5. When did you last consult your GP about your own health (*Please tick as appropriate*)
(*Other than for a check-up required for; work, insurance, or vaccination*?)

- ☐ **In the last week**
- ☐ **In the last month**
- ☐ **In the last 6 months**
- ☐ **In the last 6 to 12 months**
- ☐ **1 to 5 years**
- ☐ **6 to 10 years**
- ☐ **I can't remember**

6. If you have consulted the Doctor in the last year (*Please tick as appropriate*)
(*How many consultations did you have during that year?*)

- ☐ **More than 1 per month**
- ☐ **More than 4 per month**
- ☐ **More than 4 in the year**
- ☐ **Less than 4 in the year**

7. Did your partner (ex) accompany you to the Doctors?

☐ **YES** ☐ **NO**

8. How often do you exercise? (*Please tick as appropriate*)
(Moderate or vigorous exercise may be; brisk walking, gardening, climbing stairs, jogging, etc., and is for at least 30 minutes per day?)

☐ **Daily** ☐ **Weekly** ☐ **Less often** ☐ **Never**

9. Do you smoke?

☐ **YES** ☐ **NO**
How many cigarettes? Per **Day……** **Week…….**

How many years have you smoked? ……..

10. Do you consume Alcohol?

☐ **YES** ☐ **NO**

If YES do you drink (Please tick)

Daily ☐ 1 or 2 days a week ☐ 3 or 4 days per week ☐ 5 or 6 days per week ☐

(*One unit of alcohol is equivalent to: ½ pint of normal beer, a small glass of wine or a single measure of spirits.*)

Average units consumed on a day when you drink ……..number of units

11. Do you use Contraceptive pills? ☐ YES ☐ NO Which? ……..

If YES how long have you taken these for? Years……

Have you had breaks from the pill to have children? (Please list) Years ..… Months…….

12. Have you used, or do you use non prescription drugs?

☐ **YES** ☐ **NO Which? ……..**

If YES how often do you use drugs? ☐ Daily ☐ Weekly ☐ Monthly ☐ Less often

How long have you taken drugs for? Years……

13. In your opinion, do you eat enough and healthily?

☐ **YES** ☐ **NO**

I eat Daily (Please tick) ☐ Breakfast ☐ Lunch ☐ Evening meal ☐ Snacks

14. Are you receiving treatment for high blood pressure?

☐ **YES** ☐ **NO**

15. Is there a history of high blood pressure (Hypertension) in your family?

☐ **YES** ☐ **NO**

16. Do you take medicines regularly/ when necessary? ☐ YES ☐ NO

What? (Please list)

……
……

17. Do you feel that violence has affected your health?

☐ Yes, very ☐ Yes, moderately ☐ Not entirely ☐ Not at all

Part Two - History of Health Conditions Experience- (previous and present illnesses)

Condition	Do You Suffer From this Condition Symptom Frequency (Please Circle)	Does a member of Your family Suffer From this Condition
18. Migraine	All the time Often Sometimes Rarely Never	Yes/No
19. Disturbed vision	All the time Often Sometimes Rarely Never	Yes/No
20. Asthma	Severe Mild Never	Yes/No
21. Eczema/Psoriasis	Severe Mild Never	Yes/No
22. Allergies Please state Type……..	Severe Mild Never	Yes/No
23. Diabetes	Type I Type II	Yes/No
24. Back/Joint/ Musculoskeletal Problems	All the time Often Sometimes Rarely Never	Yes/No
25. Clinical Depression	Severe Moderate Mild Never Suffered	Yes/No
26. Headache/Blackouts	All the time Often Sometimes Rarely Never	Yes/No
27. Neurological Disorders i.e. Stroke If Yes Please specify kind of stroke. Definitions below: An Ischemic Stroke is when a blood clot blocks an artery(most common Type) An Hemorrhagic Stroke is caused by a weakened artery bursting, allowing blood to seep out of the artery wall Which tests did you have in hospital?	Yes No a)Ischemic Hemorrhagic b)Tests you had in Hospital: 1. Ultrasound to look at arteries in neck 2. CT Scan 3. MRI Scan 4. Blood Tests	Yes/No Yes/No
28. Stiff Neck/Tension	All the time Often Sometimes Rarely Never	Yes/No
29. Eating Disorders	All the time Often Sometimes Rarely Never	Yes/No
30. Sleep Problems	All the time Often Sometimes Rarely Never	Yes/No
31. Bowel Disorders e.g. diarrhoea	All the time Often Sometimes Rarely Never	Yes/No
32. Cardio-vascular Disorder e.g. Heart Attack/Angina Irregular Heartbeat	Angina: Heart Pain Irregular Heartbeat Heart Attack	Yes/No

Part Three – History and type of Domestic Violence

The Government defines domestic violence as "Any incident of threatening behaviour, violence or abuse (psychological, physical, sexual, financial or emotional) between adults who are or have been intimate partners or family members, regardless of gender or sexuality."

(An adult is defined as any person aged 18 years or over. Family members are defined as mother, father, son, daughter, brother, sister, and grandparents, whether directly related, in-laws or stepfamily).

33. How long were you within a domestic violence relationship?

Years …….. Months…….

a) Was the main perpetrator your partner/spouse? ☐ YES ☐ NO

b) If NO please state relationship i.e. Mother /father/brother/sister/uncle etc.

……..

34. Please indicate the type(s) of abuse you experienced. (*You may tick more than one box*)

☐ Psychological ☐ Physical ☐ Financial ☐ Sexual

☐ Emotional ☐ Other (*Please specify*)……..

35. Please indicate when you first experienced Domestic Violence within the relationship.

☐ When we first met ☐ When we were going out ☐ When we were engaged

☐ When first married ☐ When first living together ☐ Within the first year

☐ Within first 5 years ☐ When pregnant ☐ Can not remember

36. Did the level of violence increase over time?

☐ Yes ☐ No

37. Did you ever receive any visible injuries?

☐ Yes ☐ No

If YES please describe.

……
……
……
……

38. Did you ever visit a health professional as a result of your injuries?

☐ Yes ☐ No

If Yes. Please indicate who. ☐ Doctor ☐ A & E Dept ☐ Dentist ☐ Midwife

☐ Other please state……

39 . Did you disclose how the injuries were caused?

☐ Yes ☐ No

40. Were you asked?

☐ Yes ☐ No

41. Did the health professional give you the address or telephone numbers of shelters for victims of domestic violence?

☐ Yes ☐ No

42. Types of physical injury sustained? (*You may tick more than one box*)

☐ None ☐ Reddening to skin ☐ Graze ☐ Bruise ☐ Swelling

☐ Cut ☐ Scald ☐ Burn ☐ Fracture ☐ Bite

43. Part of body most frequently assaulted or injured? (*You may tick more than one box*)

☐ Head ☐ Neck ☐ Shoulders ☐ Upper Arm ☐ Lower arm

☐ Back ☐ Lower back ☐ Buttocks ☐ Chest ☐ Stomach

☐ Abdomen ☐ Legs ☐ Face ☐ Other

44. How was injury caused? (*You may tick more than one box*)

☐ Slap (open hand) ☐ Punch (Closed Hand) ☐ Kick ☐ Strangled

☐ Cigarette ☐ Hot Liquid ☐ Knife ☐ Bite

☐ Other please state……

The Medical definition of Strangulation: is defined as a form of asphyxia, lack of oxygen, characterized by closure of the blood vessels and/or air passages of the neck as a result of external pressure on the neck.

The Dictionary definition of Strangulation: To kill or attempt to kill by squeezing the throat with the hands, a cord, etc.

45. Have you ever been strangled?

☐ YES ☐ NO

46. Have you ever been admitted to hospital as a result of being strangled?

☐ YES ☐ NO

47. How many times have you been strangled?

Number of times ……

48. How were you strangled?

(The following methods below explain the different types of strangulation)

Manual: One or two hands ☐ Chokehold Forearm ☐

Ligature: Use of Object (Clothing/belt/rope) ☐

49. Were you shaken simultaneously while being strangled?

☐ YES ☐ NO

50. Did you experience difficulty in breathing?

☐ YES ☐ NO

51. Did you experience swelling of the throat?

☐ YES ☐ NO

52. Did you experience Neck Pain?

☐ YES ☐ NO

53. As a result of being strangled. Did you experience any of the following?

☐ Dizziness	☐ faint	☐ loss of consciousness
☐ Pain to throat	☐ Eyelid drooping	☐ Paralysis
☐ Loss of control of bowels	☐ Vomit	☐ swallowing problems
☐ Breathing problems	☐ hoarse or raspy voice	☐ loss of memory

GENERAL HEALTH QUESTIONNAIRE (GHQ-12)

Name:..... Date: .....

Please read this carefully.

We should like to know if you have had any medical complaints and how your health has been in general, over the last few weeks. Please answer ALL the questions simply by underlining the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past.

It is important that you try to answer ALL the questions.

Thank you very much for your co-operation.

Have you recently . . .

1. been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
2. lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
3. felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
4. felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less than usual
5. felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6. felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
7. been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
8. been able to face up to your problems?	More so than usual	Same as usual	Less so than usual	Much less able
9. been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10. been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11. been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
12. been feeling reasonably happy, all things considered?	More so than usual	About same as usual	Less so than usual	Much less than usual

If as a result you need to speak to someone please contact one of the groups listed on your covering letter or the researcher

All information will be held in the strictest confidence

Please return in the prepaid envelope provided

If you have any comments you would like to make about this survey, please write them on this page. Thank you

Thank you for your contributions to this survey it is greatly appreciated.
Please return your questionnaire in the reply paid envelope provided.
If the envelope has been misplaced please forward to:-

FREEPOST RRKJ-YABL-AKAR
Y. SMITH
P.O. BOX 474
KEIGHLEY
BD22 8WR